This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

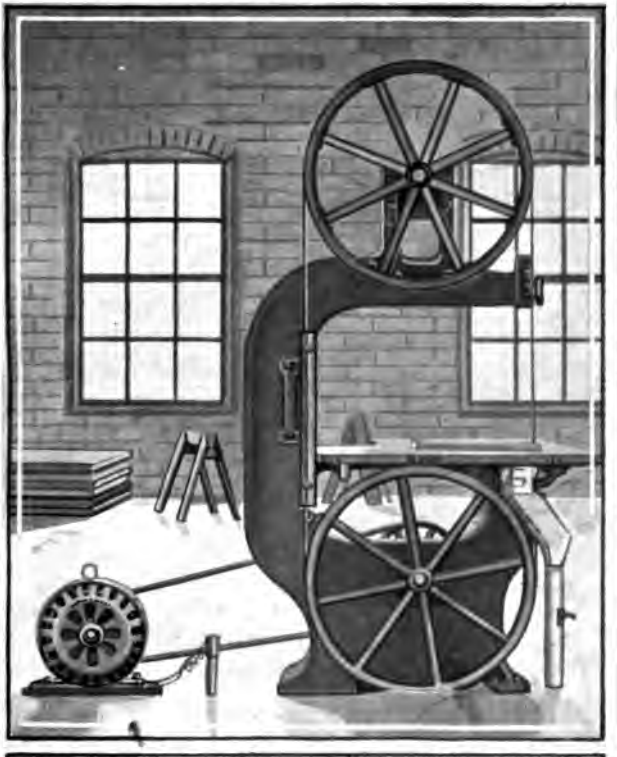
+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

WOOD CRAFT



APRIL --- 1914

tisfactory. Used your outfit
ctory and decided on same
or here. Have also had ex
th Power and Hand Screw
ther can be compared to the
rol of your new Press.

American Panel
Cattaraugus, N.
Feb. 27, 1914

't say your work is different

lany panel, furniture, door, piano and
ther manufacturers of veneered and
uilt-up work are getting gratifying results.

Handy Clamps are Better

No. F
Screw is 2 inches above Tempered Steel Bar

No. C
Tempered Steel Bar Clamp

Tempered Indestructible Steel Bar Clamps. Screw works in two bearings, increasing the life of the clamp over 100 per cent.

"Handy" Patented Steel Spindles and Steel Nuts on "Hand Screws" guaranteed not to break.

STYLE A can be kept rigid or attached in any position.

Strongest Hand Screw Made

Clamp works nearly ***twice as fast*** as common wood screws. Spindles have a right and left hand thread. Gives a tighter grip and less power required. Glue cannot stick to spindles. Handles guaranteed not to get loose. Jaws are best seasoned maple. **Order Samples.**

Send for Catalogue and Prices of Full Line of Clamps

Handy Mfg. Co.

27 E. Madison St.
CHICAGO

Shingle Saw Charm

THE NEW YORK
PUBLIC LIBRARY
608776
ASTOR, LENOX AND
TILDEN FOUNDATIONS
R 1915

HERE is a full size illustration of the souvenir Simonds Shingle Saw watch charm which ought to be worn by every man in the woodworking business. The front, as can be seen, is without wording, while on the reverse side, near the edge, is engraved "*Simonds Saws are the Best.*"

This triple rolled gold plated charm is provided with a ring for fastening to watch chain or silk fob.

We will mail one of these charms to anyone who mentions "*Wood Craft*" and sends us 23 cents in postage stamps, in part payment of the charm.

Advertising Department

Simonds Manufacturing Company

Fitchburg, Mass.

608776

Published by
THE GARDNER PRINTING COMPANY
CAXTON BUILDING, CLEVELAND, OHIO

VOL. XXI APRIL, 1914 No. 1

WRINKLES FOR WOODWORKERS

A chunk of longleaf pine very nearly equals a block of cast iron in resistance to compression if blocks are of equal height and weight.

Brier pipes originally got their name from being made of the root of the white heath or brier, but many "brier" pipes today are made from apple wood, which is the favorite material for saw handles.

Among the exhibits of the Redwood Mill Owners Association at the Forest Products Exposition in Chicago and New York this month will be a table having a top of one piece of redwood 72 inches long, the length of the table being the width of the plank

Wood is so frequently looked upon as a weak material that it may surprise many to hear that a bar of hickory is stronger against a pulling strain than a wrought-iron bar of same length and weight.

A long step is it from sufficient foresight to the fussing interference that is everlastingly tinkering. Good enough is right. More than enough good is good for nothing. Let up on the wrench, there!

English willow is an approved wood for the making of artificial limbs. Port Orford cedar, from the Pacific Coast, has been tried as a substitute but while light enough in weight it is found too coarse and brittle.

Bulletins from the Stow Mfg. Co., Binghamton, N. Y., show portable and bench grinding and drilling machines in great variety. These ingenious applications of the electric current enable the power to be brought to the work as easily as the unrolling of a ball of string.

Recent experiments on barrels showed some facts of special interest. Bilge hoops should be spaced not more than 8 inches. Heads should be about one and a half times as thick as staves. There was much variation in strength of staves, some being less than one-fourth the strength of others.

One important feature of the Forest Products Exposition will be a moving picture display reproducing in vivid detail sensational and interesting scenes of logging, milling and other attractive operations in the industry. Some of these scenes will be from the principal mills of Europe and there will be a number of very effective American films. Ex*position opens* at the Coliseum, Chicago, April 30, *nd continues* to May 9.

Metal is a frequent material for hames on light vehicles but wood hames of white ash, white oak and hard maple are preferred for heavy hauling purposes.

A general catalogue and data book is in preparation by the American Blower Co., Detroit, Mich., and will cover air purifiers, and humidifying and cooling apparatus. A preliminary bulletin is at hand and treats generally of the construction of the sirocco purifier as used for washing air employed for ventilation in thickly populated manufacturing centers.

Thomas D. West, a well-known manufacturer and textbook writer on technical topics, has written a very practical book on efficient superintendence and the conditions necessary for the attainment of excellence in their calling by foremen and superintendents. Book is applicable to all branches of industry. Price, $1.50. Address J. A. Gerblick, sales manager, 10511 Pasadena Avenue, Cleveland, Ohio.

Black walnut is preferred wood for gun-stocks which require very accurate woodwork. American black walnut is easily worked, moderately light, polishes well, and has pleasing appearance. Pieces of raw material are rough sawed to shape and ends of grain painted to prevent checking. Stock is then shipped to factory where it is seasoned for two or more years before passing into drykiln. Pieces are next sawn to dimension and prepared for rough-turning. Eight operations are required in factory, including shaping edges for guide surfaces, routing and chambering, cutting recesses for attaching butt swivel-plates, routing out space for magazine and trigger guards, and final hard finishing, polishing, *and dipping in linseed* oil. Then ready for assembling.

CHANGES THAT WORKED WELL IN A SHOW-CASE FACTORY

An investigation of the equipment in a plant that manufactures show-cases proved that the engine was fully loaded but that about 65 per cent of the load was friction. The drives were very complex, and the load-factor low. Electric drive was adopted, using over a hundred squirrel-cage induction motors, and installing a generator on the engine. After this change there was ample power available to supply an addition to the plant of nearly 25 percent of its original capacity. Besides this, continues C. W. Drake in the "Electric Journal," the maintenance of high speed at all of the wood-working machines not only increased the capacity of the plant, but gave a much better finish to the material, thus saving considerable sanding.

Adjustment can easily be overdone and the conveniences often afforded for making changes in a machine are tempting to the misuse of a wrench.

Maybe the efficiency expert was jokingly misquoted when it was said of him that he proposed to cut the legs off the wheelbarrows in order to save the time now spent by the wheelers thereof in spitting on their hands.

Many an argument has been had on the origin of *e name of a* monkey wrench. Perhaps it was due *the overadjustment* tendencies of one who mon- *ed with a* too convenient wrench.

LIGHT FOR OPERATORS OF WOODWORKING MACHINERY

Reflectors must also be good shades to throw light only where it ought to be—misplaced light is often worse than wasted because of eye strain, check accidents by having right light made right and put right

LIGHT around a woodworking machine counts for as much or more than at any other place in a plant. Unshielded lights, or lights with a reflector that does not shade the glare from eyes of workman, tire the eyes. Worst of all, the glare may not be at first objectionable but in time there comes discomfort and complaints of poor light, although the intensity of the light may be very high. Should a larger light be put in, the eye strain is merely increased.

Good reflectors direct the light upon the work, yet protect the workman's eyes. Change of the lamp location may ease the eye strain and still give good illumination.

Enlarging the light source has been found of benefit. Flickering lights are bad. Sometimes the trouble on the electric generator may be due to faulty governing of engine or to poor contact at dynamo brushes or it can be ascribed to the beams of light passing through pulleys or any other moving parts which influence disastrously the steadiness of the illumination.

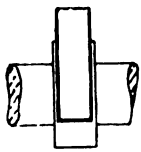
Good light is a strong check on accidents; and the whitening of walls, the layout of machines to suit windows, the regular cleaning of windows, and the *skillful arrangement* of the other lights not only *make for safety* but give efficiency because of this *increased confidence* that the better illumination *surely bestows.*

COLLARS, COUPLINGS AND PULLEYS IN WOODWORKING PLANTS

Little things of much importance in the safe and efficient handling of machines, protective devices of simple type that have proven most successful when maintained and actively followed up by some one in the plant having the authority and the experience to see that they are right and that they are kept so

PROJECTING setscrews on the collars of lineshafts or on the parts of machines, especially when of high speed woodworking machines, are especially dangerous because at the velocities employed, it is frequently difficult

Fig. 1. Steel Clip for Guard on Projecting Setscrew of Shaft Collar



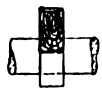


Fig. 2. Wood Guard on Projecting Setscrew

to see whether the collar has or has not a projection of any kind.

Prohibition of projecting setscrews is the safest plan. Setscrews should be countersunk or some other equally safe method of attachment ought to be provided. Collars are always in close proximity to bearings or loose pulleys, and if these are to be approached for any purpose, as is frequently the case for bearing lubrication or belt repairs, then to *avoid any trapping* of the hands or the belt while *journal is in motion*, the objectionable setscrews *hould be removed* and replaced by countersunk set-

screws or carefully covered with a smooth cap or other guard.

Fig. 1 shows a simple steel clip to guard against any serious trouble from the rotating setscrew head. Care should be taken to have the clip so that it tightly hugs the collar and will not slip sidewise and expose the screw head. Ends of the clip must come smoothly down on the collar or the clip corners are likely to catch onto the unwary. Fig. 2 is a wooden substitute for guard shown in Fig. 1.

Couplings ought to have neither projecting bolt

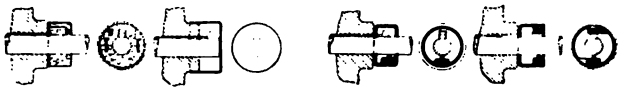


Fig. 3 Fig. 4 Fig. 5 Fig. 6

Fig. 3. Wood Cap in Halves, Woodscrewed Together
Fig. 4. Sheet Metal Cap on Pulley Hub
Fig. 5. Cast Iron Cap with Countersunk Setscrew
Fig. 6. Cast Iron Cap in Halves with Countersunk Screws

heads, nuts, screws, nor keys, and be made with countersunk bolts and nuts, shrouded flanges, etc. But as none of these precautions are always to be found on the older installations the projecting dangers can be covered by wood or metal casings. Fig. 3 shows a wood cap in halves screwed together to cover a projecting key head on a coupling or pulley. A sheet metal cap on a pulley hub is in Fig. 4. A cast-iron cap fastened by a countersunk setscrew is seen in Fig. 5, and a more elaborate scheme of same sort is exhibited by Fig. 6.

When *machinery is newly* installed the caps can *be in one piece and* slipped into place before erec*tion, but the foregoing* figures show how the troubl*e may be met when* machinery is all in position ar

not to be disturbed. For projecting keys on shaft ends, as in Fig. 4, sleeves or caps can be forced onto the hub of the coupling or pulley.

Fig. 7 shows wood disks in halves screwed together to inclose a coupling. Fig. 8 is a sheet-metal band screwed to and compactly inclosing wood disks on a coupling. Fig. 9 is a means of avoiding any attempt to fit cover onto coupling and merely incloses it by a metal casing attached to ceiling.

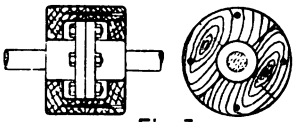


Fig. 7

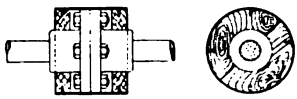


Fig. 8

Fig. 7. Wood Disks In Halves Woodscrewed Together.
Fig. 8. Sheet Metal Bandscrewed to Wooden Disks.

Pulleys ought to be well overhead, say about 6½ feet or more above the floor level. If less than this distance from floor or any other place on which workmen may stand, then they ought to be fenced in so securely as to prevent accidental contact by anyone.

Exposed gears ought in above circumstances to be incased with guards fully protecting around the teeth and rims. A slide or hinged section in guard will permit lubrication of the gear teeth but these should be arranged to close by their own weight, drop by gravity, or shut by use of a spring, so that any negligence of the oiler will not make the apparently safe guard a trap for the misled.

Have guards completely covering points of danger. *These have* the additional advantage of keeping *out dust and* also limit the splashing of greas

Belts and their pulleys may often be fenced off by the one guard. Fig. 10 is a guard of this kind. Another type of wire netting protection as applied to an overhead pulley is seen in Fig. 11.

Spokes of pulleys and of band-wheels may come in contact with ends of boards. Sides of them ought on that account to be fenced or the spaces between spokes can be filled in with disks and thus convert them into plate wheels.

Belts can be troublesome by splitting at the

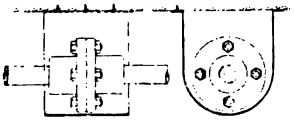


Fig. 9 Fig. 10 Fig. 11

Fig. 9. Sheet Metal Band Fastened by Screws to Ceiling
Fig. 10. Wire Netting Guard for Belt and Pulley
Fig. 11. Hinged Guard of Wire Netting for Overhead Belt Pulley

splice, and then the projecting ends may strike the adjacent guard. In such a case the proposed protection becomes a source of risk and possible injury. Against this evil there is the protection of frequent and thorough inspection by competent examiners appointed for that special purpose.

Another protective plan is to be sure that the belt splice as far as this is practicable runs in the direction least likely to occasion trouble if the joint should loosen at tip and curl outwardly from the belt.

A folder from the Garden City Fan Co., Chicago, Ill., briefly explains the especial merits of the "Cycloidal" fan and will be sent with other literature along this line to anyone on application.

GEORGE WESTINGHOUSE—INVENTOR AND EMPLOYER

Born with limited opportunities he became eminent

DEATH of George Westinghouse on March 12 removes a famous inventor and manufacturer known by name and product to every mechanic. Born in 1846, the son of an inventor of agricultural apparatus, he as a boy invented a rotary engine and at an early age passed the examination for Assistant Engineer in U. S. Navy. Barely seventeen, he enlisted, 1863, in the National Guard, and became corporal of cavalry. Honorably discharged a year later, was appointed Third Assistant Engineer in Navy. At close of war he resigned. Same year, 1865, he invented device for replacing railroad cars on tracks, then came the air brake in 1869, and later he formed other flourishing companies. In electricity, natural gas, railroad progress, etc., he most successfully caused great advances and the Westinghouse companies *employ 50,000 men.* Here and abroad he has personally received highest honors from associations of scientists and engineers.

George Westinghouse, Sailor, Soldier, Industry Builder

BELT SHIFTING ON CONE PULLEYS

A plan that promises much but we have not found it in practice to work as well as has been claimed

CONTRIBUTOR to the "Mechanical World" submits a scheme which he claims has been tried and proved to be satisfactory for shifting the belt on a cone pulley.

At A, Fig. 1, is a bar carrying the belt forks and sliding in the guides B which are fastened by ½ inch setscrews to the brackets C. Pins ¾ by 1½

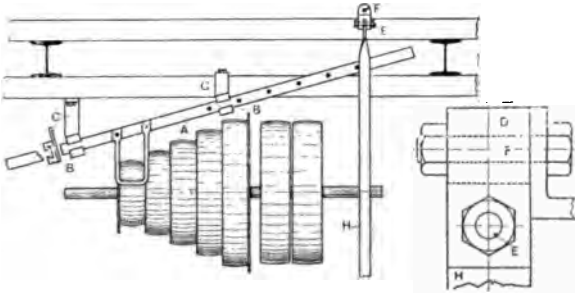


Fig. 1 Fig. 2

Fig. 1. The Shifting of a Belt Along the Steps of a Cone Pulley
Fig. 2. Method of Shifter Suspension

inch are screwed into the bar A at intervals equal to width of belt. Handle H, Figs. 1 and 2, swings outwardly from a block D on the pin E, and sidewise, in direction belt is to move, on pin F.

Handle H hangs clear of pins when belt is in position. Operator swings handle from pin to pin so *that belt is to be* moved step by step to the required *position.*

Unfortunately the nearness of the pins in A to th

handle fulcrums at E and F will result in the lower end of the handle H swinging in big arcs that are not only likely to foul other parts of the machine but result in very awkward movement of the belt.

It will be seen that the sketch does not show the arrangement as applied for the very common vertical belt. Moreover, the bar A may stick in the guides if held securely against any accidental slip, or it may slide dangerously if loosened.

Probably a better plan, especially in the case of fast-running machinery for woodworking, would be to adopt a geared bar moved by a pinion on top end of a vertical rod. Meantime the handy stick with or without a pin at end will be used whenever the operator fails or does not care to slip the belt across cone steps in the old way with a flip of the hand.

Put no unnecessary pressure on the wrench in fastening knives. When it holds securely, that's sufficient. Should a nut feel to yield slightly at limit of tightening, then discard that bolt then and there. An overstrained bolt is a dangerous thing, especially for the next man who comes along and knows nothing of its weakness.

Handicraft in Wood and Metal is by John Hooper and Alfred J. Shirley and is published by the Manual Arts Press, Peoria, Ill. Has over 300 fine illustrations, historical notes on use of wood and metal. Three-year courses in woodwork and metalwork, special models, chapters on historic craftsmanship, materials, design, tools, etc. Drawings are especially informing and attractive. Price, $3.00.

GRINDING KNIVES ON PLANERS AND JOINTERS

Preserving equality and cutting excellence of knives

REPLACING knives after grinding is a critical job demanding much patience and skill and therefore the plan of sharpening the knives while they remain in position appeals to those desirous of perfect alignment with consequent evenness of cut. Figs. 1 and 2 show the

Fig. 1. Sharpening Device Applied to Jointer Knives

"Quicsharp" device, easily attached, adaptable to all planers, light of weight, and accurate in action.

Motor is mounted in grinder head, current being taken from ordinary lamp socket. Grinding wheel is adjusted by thumbscrew and feeds by constant pressure up to a positive stop. Knives are concave ground. One plant reports four planers now doing previous work of five and with reduction of one-h

in cost of knives. Grinder is made by the Sto bridge Machine Co., Worcester, Mass.

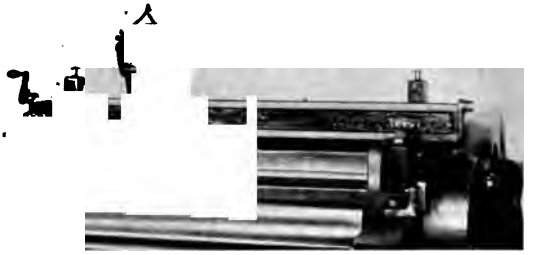


Fig. 2. Another Application to a Woodworking Machine of Knife-sharpening Device

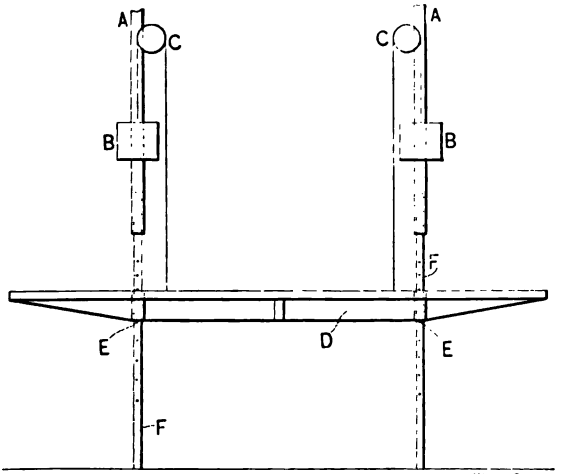
THE MAPLE DISH ASSOCIATION

The Maple Dish Association, an organizatior manufacturers of sugar maple dishes, form known as standard wire-end butter dishes, has b formed to exploit the sanitary and other advanta of the maple dish as a container for foods dispen in retail stores. At a meeting in Chicago, at wh the Association was formed, were present M. Wallace, the Escanaba Mfg. Co., Escanaba, Mi F. M. Longnecker, the Oval Wood Dish Co., De Ohio; Howard Smith, the Ludington Woodenw Co., Ludington, Mich.; W. C. Hull, the Oval W Dish Co., Traverse City, Mich.; Mr. Parish, Richmond Cedar Works, Richmond, Va., and R Sweers, the Oval Wood Dish Co., Delta, O Riley Sweers is president of Association, F. Longnecker, treasurer, and Sterling Beeson, se *tary. Offices,* 44-45 Produce Exchange, Tol *Ohio.*

ADJUSTABLE SCAFFOLD FOR USE ON THE SHOP FLOOR

Method of supporting work at various heights, and a scheme for an appliance that is intended to go easily out of the way when not wanted on the floor

SKETCH shows layout of a light adjustable scaffold which may be pushed out of way overhead when not in use. The 2-inch pipes, A, are clamped to the steel members of roof trusses by suitable clamps at their upper ends. Over these pipes slide counterweights, B, which through



Support for Work and the Means for Quickly Making It Removable and Adjustable

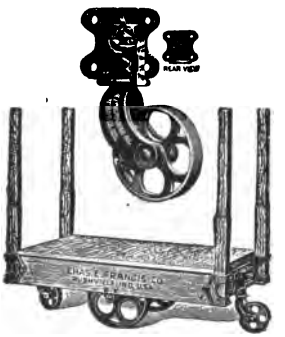
light cables and the pulleys, C, balance weight of scaffold, D. Stage is held at any required height from floor by pins, E, in the 1½-inch pipes, F, *which slide freely* in the 2-inch pipes. Holes a

drilled in lower piping at proper intervals to permit any desired adjustment of scaffold. Lower ends of these pipes normally rest in sunken sockets in shop floor to prevent side slip. When floor is to be cleared pins are inserted above and below the platform and the whole is then pushed up to bottom of the 2-inch pipes. Scaffold is stiff and safe, easy to adjust, takes little floor space when in use, and none when stored overhead.

THE LATEST FRANCIS FACTORY TRUCKS

Enough trucks means having a few extra as well as having them of the right kind to keep things moving

STYLE of truck shown here is commended because the high platform truck with large center wheels and swivel-end wheels saves considerable time and labor. Have enough trucks to avoid unnecessary rehandling of work, or trucking is liable to be a source of great loss in time and labor. An experienced man made the statement that when you think you have enough trucks, order as many more and you will find you can use them to good and profitable advantage. Accompanying illustration shows a popular truck with standard size platform, 27 by 48 inches, with malleable iron corner sockets for removable stakes, large center wheels, new style swivel casters, all carefully machine-fitted so truck



New Style Caster Above and the Platform Truck Below

runs easy, and made unusually strong to be practically unbreakable. Manufactured by Chas. E. Francis Co., Rushville, Ind.

DRIVING A NAIL BY MACHINERY

Reduction of lumber in boxes by reason of improvements in nailing them together, an investigation that resulted in certain radical changes in so apparently simple a thing as the putting of a nail where it will do the most good with greater economy of stock

MANY users of boxes find the thickness of lumber they were compelled to use has been excessive, as far as weight of contents of box and capacity for resistance contained in stock were concerned. Difficulty in securely fastening together sides, bottom and top of box is the reason, as this could not be satisfactorily done by ordinary method of nailing with thin stock, since there is then the danger of splitting boards or of making an insecure joint.

Problem occupied the mind of an engineer responsible for expenditure of thousands of dollars per annum upon lumber for boxmaking. He soon found that if nailing could embody a clinching or locking action the thickness of lumber could be reduced. His experiments are described in the "Engineer." He devised a new system of "hook" nailing.

Nailing is effected in a machine fitted with a vise attachment automatically gripping the under or vertical board while nails are driven. Back jaw of *vise carries dies* to turn the nails back into the lumber *in hook form.* Fig. 1 shows section through *vise jaws.*

Nails are driven angularly across intersection of boards, then through outer face of box side or end, and turned back in hook form. Turning action may be seen by reference to Fig. 1.

The dies are in two forms, known as "straight"

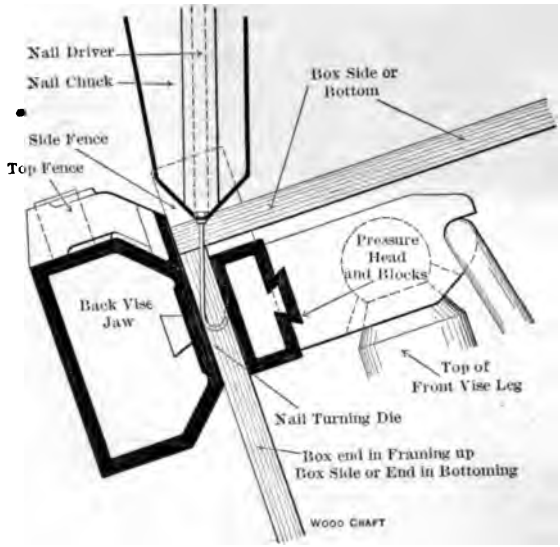


Fig. 1. Section Through the Vise Jaws and Showing Nail Driven Into Box

or "bar" dies, and "curved" or "crescent." The bar dies turn the nails straight back, as shown in bar clinch, Fig. 2. These are suitable for driving nails across grain as when nailing on bottoms. The *curved or crescent* dies turn in a diagonal direction, *as in sketch of* crescent driving, Fig. 2, this form *being for frame* nailing, with grain as when nailing *sides to ends.*

The dies make slight impressions in board, but cause the nail stitches to lie beneath surface. The indentation does not materially detract from neat appearance of boxes.

Two machines ordinarily required for making box, the "framer" for nailing up frame and the "bottomer" for bottoming. Any number of nails within capacity of machines may be driven at once, spaced as desired. Method of nailing is chiefly remarkable for saving of lumber. Boards as thin as 1/16 inch

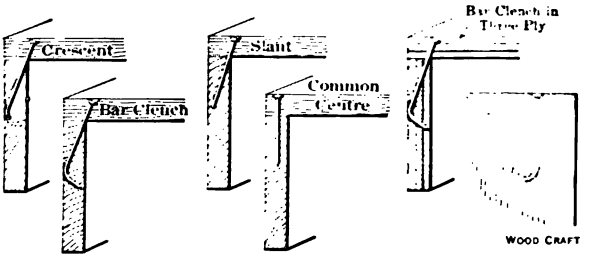


Fig 2. Various Methods of Applying Nails in Boxmaking

and up to 1 inch thick can be nailed up in common soft or hard woods. Warped boards are automatically straightened out by the vise pressure before nails are driven. Customary in ordinary boxmaking to use ends of greater relative thickness than sides, but this is now obviated, and a single minimum thickness of board may be used for the entire box.

Saving of lumber amounts to approximately 25 *per cent in small boxes* and up to 50 per cent on the *ends of such boxes.* Risk of theft is reduced, it be*ing practically impossible* to open box without dam*aging one or more* panels.

Main portion of machine is similar to ordinary type of nailer, but modified to carry vise. Front jaw of vise is on top of arm which automatically closes in advance each time nails are driven. Back jaw is a steel bar having vertical, horizontal and tilting adjustments, the latter regulating driving angle for nails. Jaw may be set vertically for straight nailing.

The operator on the framer inserts a box end between the vise jaws with left hand, and then with his right hand a box side is placed above end, and both held close up to nail chucks, using the latter as a top gage and taking care that boards are close up to side fences, on both back jaw and table. A pedal is then depressed and the nails driven, then nailed-up boards are removed to left hand, and operation is repeated. There is no need to place a loose side on table when beginning to nail up frame, as vise grip takes thrust of nails. Frame completed, the operator of bottomer places frame over pressure head, then a bottom in position up to chucks. All four edges can be nailed in sequence, notwithstanding that ends are usually thicker than sides.

Obviously, lids of boxes cannot be nailed by the vise nailing attachment, which works inside the box, and a portable hand-nailing device is used instead. The device gages position of nails relative to edge of box, guiding and driving them in a slanting direction. The apparatus is a nailing machine on a small scale. It has a nail reservoir, from which nails are delivered by a cut-off into a nail chuck or *box, and they* are driven by a weighted plunger.

Report, repair, and renew. Don't worry along *with out-of-order* or out-of-date equipment.

HIGH-SPEED BELT DRIVES IN MACHINE WOODWORKING

Layout for a drive that shows considerable forethought and resulted in a very satisfactory arrangement, the troubles of high speed, length of belt drives, adhesion of belt to pulley, arc of belt contact, and of materially adding to the power transmitted

MOTOR can often be applied where a line shafting cannot be conveniently located, but there are times when a motor installation requires considerable thought. One such instance in connection with a cabinetmaker's shop and sawmill is described in "Power" by James A. Seager.

Placing the machinery itself on false floor elevated some 4 or 5 feet above ground floor of building was adopted, so as to place the electric motors underneath working floor of factory and also provide for shaving and dust removal. Advantage is obvious, as both head and floor room are saved by putting motors below machines and having but a short length of belt coming into working room.

With a large four-cutter molding machine, some difficulty was experienced, owing to arrangement in Fig. 1 being adopted. Short belt, high speed, stretching, and vertical position, it was difficult to keep it from slipping. Much trouble was occasioned by taking up belt and finally arrangement in Fig. 2 was devised.

Ends of two pieces of bar iron, A, of flat section were heated and while red hot, bent over a round bar so as to form an eye, B. Bars were then bent into position shown and a 1-inch hole drilled at C. Bars pivoted at B were put under base-plate of

motor to lie centrally with bolt holes in base and corresponding holes were drilled in bars, base being then bolted up to bars to tightly secure them.

Four angle-pieces D to support bars were fixed to floor. A bar was also passed through angle-irons

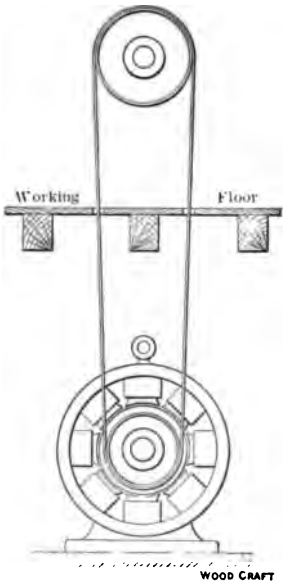


Fig. 1. Motor Drive from Below the Floor in Woodworking Plant to a Four-Cutter Molder

at right, and upon this bar were placed two threaded bolts, each ¾ inch in diameter and having at lower *end an eye which* slipped over bar just mentioned. *These bolts were* fitted with nuts and washers and a *spiral spring* capable of resisting strong compres*sion.*

Motor was thus hung on two spiral springs, weight of motor being balanced by compression on springs. By tightening or slackening lower nuts the springs could be compressed or extended to give weight of motor more effect and thus raise or lower it in position. After belt was put on, lower bolts were slackened until sufficient tension was given belt.

Elastic nature of suspension frame provided against sudden jerks in molding machine when work is put into cutters, and the arrangement may

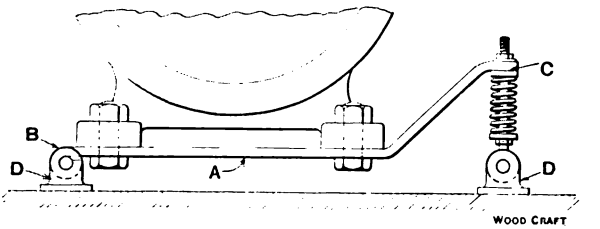


Fig. 2. A Spring Support for the Motor

be recommended to any who finds trouble owing to short, jerky drives.

Difficulty has often been experienced in arranging and running and electric motor drive for high-speed woodworking tools, owing to both motor and machine spindles running at high speed. With small pulleys there is usually much slipping when at high speeds.

Sometimes, after proper size of pulley and proper width of belt has been used to transmit a given *power, belt slips* badly and power cannot be obtained. *Reason* for this is twofold. In first place, *with high belt* velocities there is a tendency for bel

to carry on its under surface, between belt and pulley, a thin layer of air which destroys adhesion and prevents transmission of power. In many cases it has become advisable to drill holes in faces of pulleys fairly close together to provide vents so that air carried under by belt can be squeezed out. This expedient will often increase power transmitted at high speeds.

Another trouble with high-speed transmissions cannot be so easily overcome. This is owing to centrifugal force of belt exerting a stretching action and making it run in a straight line instead of close around pulley. Action, exaggerated, is shown in Fig. 3. Result is that while belt is at rest there is sufficient arc of contact on pulley surface, but when belt is in action this arc tends to diminish, until at very high speeds it decreases so much that there is loss of power.

A good arrangement is shown in Fig. 4. Just above lower pulley and on each side are two idler pulleys on pivoted arms held by a frame or supported on floor so that arms are parallel to one another. Two free ends of pivoted arms, A, are held together by two eyebolts, B, with right and left threads respectively, eyes being slipped over projections on pivoted rods. Screwed ends of these eyebolts are connected by a right- and left-handed sleeve coupling, so by turning coupling the idler pulleys may be drawn toward each other or to move outward.

When belt is in position it bears on both pulleys and will move them, owing to flexible nature of the arrangement, so that bearing pressure of each pulley on belt is equal to that on the other and this condition will maintain itself whether the belt is

running or at a standstill; that is, belt will be controlled by position of idler pulleys. Bending tendency due to centrifugal force, shown in Fig. 3, occurs only when the belt has left the surface of idler pulleys. Arrangement gives a very powerful

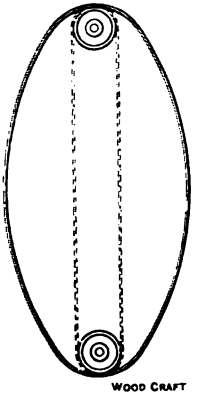


Fig. 3. How Belts Go at High Speeds

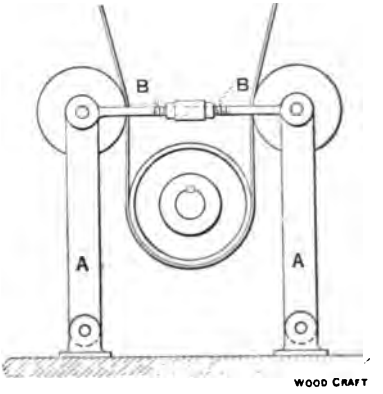


Fig. 4. A Pivoted and Adjustable Idler

grip, and it has been found that by this simple device the power transmitted by belts and pulleys can often be largely augmented.

Hard maple is used by New York makers of butchers' blocks, though other States prefer sycamore. The sycamore article is cut from large timbers and used solid, while hard maple butcher blocks are built-up one-inch boards glued into blocks of 24 inches diameter. Sugar maple has a cleanly satin-like lustre, and wood is hard, fine *grained, compact* and tough.

ABATEMENT OF SMOKE AT PLANTS

A few of the instructive kinks put together by a number of manufacturers who desired to get smoke elimination if at all practicable in their neighborhood

SEVERAL manufacturers lately got together a few inquiries and suggestions for the benefit of their associates in the hope that local smoke abatement might result. The points deserve further circulation because it was urged that smoke elimination pays.

Is your fireman capable? Proper firing instead of ordinary shoveling may save 30 per cent of the fuel bill. Coal should be supplied to the furnace frequently in small quantities. Better results are obtained from an almost continuous and uniform supply.

Do you burn wood, paper or other refuse? It is not generally known but it is true that wood, paper and refuse make excessive smoke.

Is there sufficient draft? Stack may be of insufficient height or area. Breeching may be faulty. Perhaps fireman is forced to poke fire continuously to maintain pressure. This means incomplete combustion and adds to fuel bill. A few dollars well spent might change this condition.

Is your furnace overloaded or underloaded? Either condition will produce smoke. A change in area of stoker grates may change fuel bill.

Are your conditions such as to demand a variable load? Quick changes in load make smokeless combustion more difficult. Perhaps extreme carefulness might help.

*Is your com*bustion chamber large enough? In-

sufficient combustion space is a frequent condition in old plants.

Is your furnace and grate adapted to the coal you burn? There is almost no equipment which will handle equally well all fuels.

Have you installed an expensive patented smoke consumer which has failed to give satisfaction? Economical and therefore smokeless consumption of fuel is most often effected by correct design in your plant.

ADRIEN M. MARGANTIN, FURNITURE DESIGNER

SAMUEL H. RANCK, librarian of the Grand Rapids Public Library, Grand Rapids, Mich., has published an appreciative essay in his "Library Bulletin" of the late Adrien M. Margantin, chief designer for the Berkey & Gay Furniture Co., of the above city. Born in Paris in 1859, educated at the Ecole des Beaux Arts there, then a designer of interior finish in London, later on in 1886 an independent artist in New York, he came to Grand Rapids in 1891 and thence onward was associated with the Berkey & Gay Furniture Co. Of charming personality, he was a man of many friends and wide activities, giving unstinted service to projects for the advancement of the industrial art of which he was so excellent an exemplar.

Many a worrying trouble with the machine product is due to the wear as well as the misadjustment of the active elements in the machinery. To test, to gage, and to rectify are the obvious remedies to be *frequently applied.*

PREPARING AND CEMENTING OF BELTS

Tools, cement and belting—old and new—and the process of swiftly making strong and smooth joints

CEMENTING endless belts (either new ones or old ones that have parted in service) is not as well understood as it might be by the average mechanic. To prepare an old greasy belt, first step is to clean it by soaking in benzine for about fifteen minutes. Belt is then laid out flat on a board or bench to dry. Ends to be joined should be further cleaned by placing blotting paper over and under them, and then applying hot iron to soften grease so that it will be absorbed by blotting-paper. Of course a clean new belt does not require this treatment.

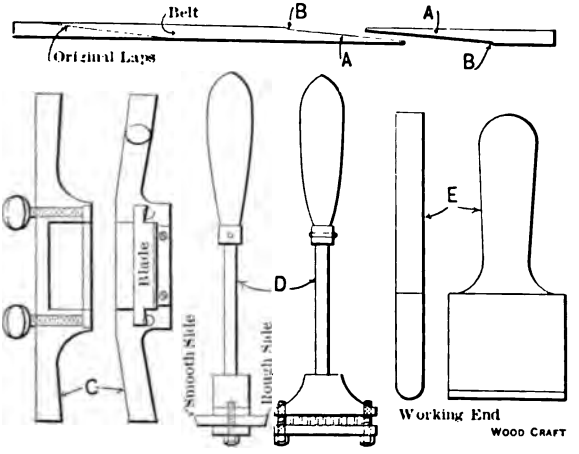
Belt ends are beveled as at A, the tools C and D being used for this purpose. Tool C is employed to rough down ends to shape, and the smooth side of D is used to scrape end of lap to produce shoulder B. Rough side of the tool is then brought into action to rough surfaces to be joined, so that they will take cement.

In beveling ends of belt, care should be taken to see that the finished lap will run in same direction as original lap in the belt, length of lap being determined from length of original lap of the old belt.

W. C. Betz also explains in "Machinery" the cement. A good cement for belting is cheapest, as a cheap cement is dear at any price. Good cement can be made from following formula: White glue, 1 pound; powdered white lead, 1 ounce. Glue is heated in a double boiler, and thoroughly stirred to a thick paste. Before using, the paste is thinned

down with grain alcohol to a thin paste. This paste is applied hot.

After joining ends of belt, the joint is rubbed with end of a wooden spatula, E, taking care to apply pressure over the entire lap. Two small pieces of



Tools and Processes for Securely and Smoothly Cementing Leather Belts

board can be clamped or nailed over joint, after which belt is placed in a warm, dry corner away from draughts. Joint should be allowed twenty-four hours to set.

The Charles Bond Co., Philadelphia, Penna., has secured an order for a big "Veelos" balata belt to be used for conveyance purposes. Belt will be 6-ply, 30 inches wide, and 1045 feet long.

DRYING RACKS AND VARNISHED WORK

Special arrangements allow drying in racks of freshly finished pieces of work without marring the surfaces

IN the Big Four Railroad car-shop at Beach Grove, Ind., all damaged passenger coaches are renovated and repaired as necessary. Before going into the car-shop proper each coach is taken through the paint-shop and there stripped of its doors, windows, lighting fixtures, and upholstery. The doors and windows are refinished in the paint-room, while the body and frame are being repaired in the main shop.

To facilitate storage of the windows and doors during drying, special racks have been designed to give large capacity, and at the same time to make only line contact on the edges of the work stored.

For the windows the racks are constructed of four corner uprights across which are attached strips of triangular molding, placed with the 45-degree side up. The freshly varnished windows are laid between these moldings, and thus are in contact only along the outer edge.

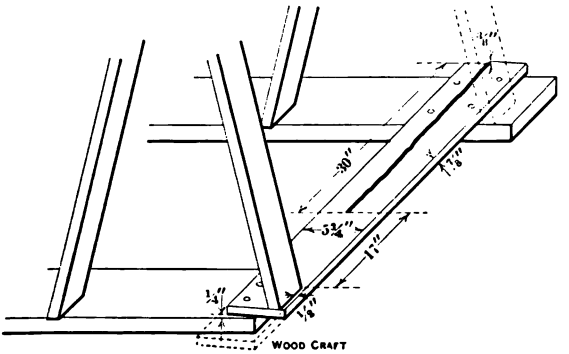
The L-shaped door racks have strips of triangular molding fastened along the base of the stand, which support the weight of the doors without marring the finish visibly, as each door is placed in the V formed between each two strips. The tops of the doors are steadied by two rounded, tapered pins gripping edge of door. Door is then supported by two line and two point contacts.

In work of this kind, where the inserted pane of glass affords an opportunity for the workman to handle the piece while wet, racks of the sort described permit of completing the whole job at once, and afford longer time for thorough drying.

A PROBABLE ACCIDENT PREVENTED BY FORESIGHT

Sometimes a few horses or a ladder or two are hurriedly assembled for a repair job that must be done without delay—here is such a case where only good luck and watchfulness prevented a serious smashup

ENGINEERING and Inspection Division of the Travelers' Insurance Co., Hartford, Conn., sends a copyrighted account of what might not unfairly be called the stage setting for an accident that happily fell short of being a tragedy.



An Easy Job for a Temporary Support at Shop and Thereby Roughly Done, Forming a Trap Laid by Negligence for the Unfortunate Who Might Fall Into It

The illustration gives evidence of the need of greater care *than is commonly* exercised in the use *of scaffolding. In* this scaffold, several horses are *arranged one over* another, with planks across *top of each row.* The end horse of one tier

placed that one leg came within half an inch of the edge of the support upon which it rested. It was not necessary to set the leg in such a risky place, and the case would have been bad enough if weight had been supported directly upon one of the planks.

A cross-piece of wood, 7/8 inch thick, had been tacked along ends of planks and leg of horse was supported by this piece at a point that was some two inches beyond end of plank, as in illustration. Weight carried by horse was so great that piece upon which leg rested was split for over half of its length. Despite the nails, the cross-piece was also tipped up until its inner edge stood about a quarter of an inch above the plank upon which it was supposed to rest; and the stress had twisted the cross-piece so that at the further end, in illustration, the two halves of the piece had separated at the crack so that one of them stood fully 3/8 inch above the other.

With nearly all shop scaffolding there appears to go a peculiar indifference with respect to dangers involved in the use of scaffolds that are poorly constructed or of improper materials. If the structure were permanent, it would be erected with far greater care; and men do not appear to realize that a fall may be equally serious, whether it is from a temporary structure or from a permanent one. Result may be even more serious when fall is from a scaffold, because ground under it is almost always more or less littered up with things that may inflict bad injuries in addition to those due to shock of fall itself. Horse scaffolds, as usually put up, are particularly open to criticism. Idea involved in their construction is very simple, and therefore they are often erected by men who should not be given work of so responsible a nature.

Keeping Your Saws Sharp

is one of the most important items in their care

MANY of the troubles usually attributed to the saw arise from lack of regular and proper sharpening. A dull saw will not cut free and easy and run true.

Keep your saws sharp. The time, cost of files, and labor will be repaid tenfold by the quantity and quality of work produced.

But remember that the more efficient the file—the less the labor required; the more durable the file—the less the expense. For this reason see that you use only

DISSTON MILL FILES

They are made of a special Crucible Steel manufactured in our own works. We were the first manufacturers in the United States to make the steel for their files, which has always enabled us to secure an absolute uniformity of quality.

We use over 35,000 ***dozen*** Disston Files per year in ***our own*** shops—thus being able to watch their quality continually.

File chart showing the making and various "cuts" of a file — free.

HENRY DISSTON & SONS, Inc.

Keystone Saw, Tool, Steel and File Works

***PHIL*ADELPHIA, U. S. A.**

THE BORING OF SMALL HOLES IN WOOD

A style of bit found very efficient for speedy work when held securely in the manner here described

SOME bits described by Owen Linley in the English Mechanic are but very little known outside certain trades. They are often termed brushmaker's bits, being used by the men in that trade, and it was in connection with brushmaking machinery that Mr. Linley first came across them. They are very cheap, and, if properly used, will cut clean holes in soft wood of very slender substance, without splitting it. They are used from about quarter down to three thirty-seconds of an inch.

In Fig. 1 will be seen two kinds of bits, that with the rounded end being preferred for the softer woods. Of course, having a taper shank, they cannot be held in a self-centering chuck; but the brushmaker fits them in a wooden chuck in a simple and ingenious manner.

A wood chuck is bored out, as in Fig. 2, and with a hand tool the hole is tapered and left somewhat rough, as shown. At end of this hole is a smaller one that takes the end or tang of the bit. Bit is knocked into this with a piece of hard-wood and a light hammer, and then set so that it runs quite true. This is easily done by trying it with a piece of chalk as it runs in the lathe, or drilling-machine, and tapping it with a hammer on whichever side it is out.

When it is true, the chuck is removed, and, being held upright, the large hole is filled with melted *lead. Chuck is* now put back in lathe and bit tried, *to see if it still* runs true. It sometimes happens

For Better-Planed Lumber
WHITNEY PLANERS

Single or Double Surfacers, Driven by Motors Coupled Directly to their Cylinders.

We don't urge you to install a Whitney Planer simply on the strength of motor-drive, nor any other one feature. We simply mention it to you as a point in evidence of the way in which we adapt Whitney Planers to modern demands.

Buy the performance—the high quality surfacing of any kind of hard or soft lumber, produced rapidly and at way-down costs for upkeep and operation.

We do say that many others, whose planing needs were identical with yours, investigated our statements as to the performance of Whitney Planers, and then installed them, equipped for their own conditions with motor or belt drive, with square cylinders carrying two or four knives, or with round cylinders and four thin, high-speed steel knives, sectional rolls and steel sectional chip breakers or flexible steel chip breakers.

Write today and ask how Whitney Planers perform

BAXTER D. WHITNEY & SON

WINCHENDON, MASS.

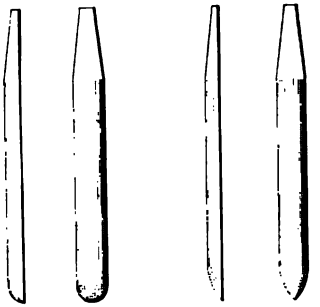
California Office, Berkeley, California
North Pacific Coast Office, Stetson-Ross Mach. Wks., Seattle, Wash.

Selling Representatives

Chicago Machinery Exchange, 1219-27 Washington Blvd., Chicago, Ill.
Wysong & Miles Co., Greensboro, N. C., Agents for Virginia, North and South Carolina, Georgia, Florida and Eastern Tennessee

that through the contraction of the lead on one side the bit runs out. If this is so, a flat-ended punch, like a nail-punch, is applied to end of lead on side that the bit runs out, and this forces it over.

When the bit has been made to run true, it should be sharpened. For this purpose the brushmaker uses an ordinary three-square saw-file, with the end



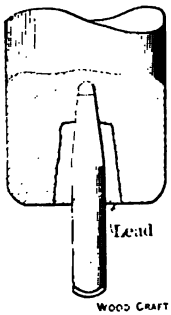


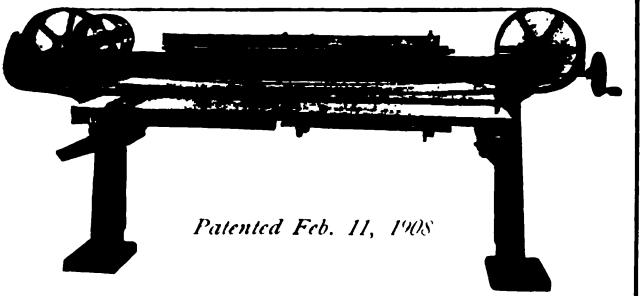
Fig. 1 Fig. 2

Fig. 1. Type of Bits Used in Brushmaking
Fig. 2. Holding the Bits in the Machine

ground and oilstoned to form a scraper. Having removed the chuck from the lathe, and holding it in the left hand with the bit resting on the bench or a piece of wood, he scrapes the inside of the end of the bit, so as to bring it up to a sharp edge, and then oilstones the outside.

There is very little substance of metal in these bits and the cutting-edge is very thin—almost like the blade of a pen-knife—and if they are kept sharp *they will* cut very freely, bringing out a core in one *piece, and leaving* a clean hole.

Our Twentieth Century
BELT SANDER



Patented Feb. 11, 1908

PERFECTION IN ITSELF

Will do double the amount of work of a hand block machine and do it better and easier.

Complete Control ***Only One Lever***

enables the operator to sand his work at any point, as much or as little as he pleases, without changing his position.

OUR SPECIALTY IS

RUBBING AND POLISHING MACHINES
BELT SANDERS
DOUBLE MITRE SAWS

Write for circulars to

Maddox Machine Company

Jamestown, N. Y.

These bits will cut in either direction; but the cutting-edge should be slightly "proud," or in advance of the other. When one edge, by frequent sharpening, stood below the other, the old-fashioned brushmaker who worked by foot-power simply sharpened the other edge of the bit and ran the lathe backward. If he ran lathe by power, he crossed the belt.

An aim in life is useless without ammunition.

Get the help of a busy man, the other fellow never has any time to spare.

Mallets for tinners and foundrymen are turned, heads and handles, out of hickory and applewood.

Balance in knives and cutters of all kinds is a detail of importance. Finish is made all the quicker and better by attention to this particular.

A curious experiment is being tried in the Beaverhead national forest. Girdling the lodgepole pine trees causes them to exude resin and the bark is being stripped from the bases of a number of them to find out what effect this may have as a preservative treatment of the poles which will be cut for the telephone trade.

A third in the series of books by William Noyes is "Design and Construction in Wood," published by the Manual Arts Press, Peoria, Ill. It is 6 by 9 inches with many illustrations, giving beginners in woodworking a textbook of the handling of tools and practice in designing simple projects in wood. Author is prolific in workmanlike hints. Price $1.5

EXHIBITION!

FOR your convenience in purchasing and that you may see what you buy, compare different machines and satisfy yourselves regarding workmanship and quality, we are carrying a *permanent exhibition* of a complete line of woodworking machinery, new and rebuilt. We are representing all the better manufacturers in the United States. Our factory for manufacturing and rebuilding is on the same premises with the show room. We shall be glad to *show you*.

Planers
Jig Saws
Re Saws
Tenoners
Matchers
Moulders
Band Saws
Swing Saws
Boring Machines

P. Pryibil Machine Company

512-14-16-18-20-22-24 West 41st St.
NEW YORK, N. Y.

Sanders
Shapers
Supplies
Jointers
Circular Saws
Twist Machines
Self Feed Rip Saws
Wood Turning Lathes
Universal Woodworkers

CAUSE OF THE FINE FIGURE FOUND IN MAHOGANY

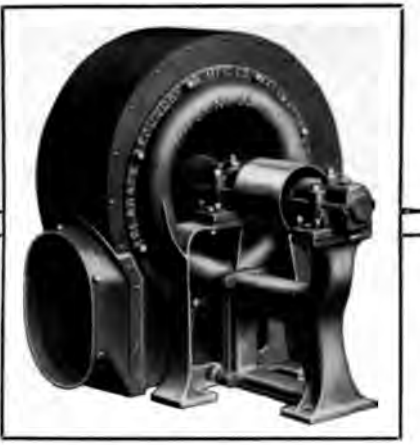
AUSE of the splendid figure to be found in mahogany was taken up for consideration by a contributor to the "Timber Trades Journal." He points out that the interesting question as to the cause of the various kinds of figure in mahogany is important.

There are several causes: the first is the irregular growing seasons; secondly, the divergence and sinuous course of the new additions of wood caused by the branches intercepting the vascular bundles; and, thirdly, the cracking of the bark as the tree advances in age. The fact of the bark rupturing allows of irregular, wavy, and spiral growths to form; one grain may be more wavy than another, and one have quicker spirals than another, and after several additions, the spiral is lost and then formed the reverse way. Thus arises the difficulty in planing the wood smoothly.

The older the tree the more figure will be found, and near the base of the tree; the younger the tree and higher up the trunk the less figure will be seen. Specimens would illustrate this better than words.

This cracking of the protective tissue or bark, as it is commonly called, would end the life of the tree, but for the fact that the living cells, which are deeper seated, heal up the breach made by forming new cells just at the parts most needed; they assume the form of scales peculiar to the tree to which *they belong.*

While the fissure is open and the wound clean, *the new cells* and vessels form more numerous ther *than at any* other part on account of the least



CLARAGE FANS

For Shavings and Dust Exhaust Systems
Single Fans—Built in sizes 25" to 110"
Double Fans—Built in sizes 25" to 80"

All sizes 80 and smaller are adjustable as to hand and discharge.

All sizes up to 60" can be inverted without special bearings.

Wheels can be removed without taking casing apart.

Bearings are absolutely dust proof and self-aligning with double oil rings and removable sleeves.

SHIPMENT FROM STOCK

Write for Catalog W-C-1

CLARAGE FOUNDRY & MFG. CO.
HEATING, VENTILATING AND DRYING ENGINEERS
KALAMAZOO, MICH.

Match Up and Joint Your

No. 15 Edging

IN work to be overlaid with veneers, such as library tables, etc., and in cheaper grades of furniture, su tables, our No. 15 will match up and jointhe stock, m of a hand jointer unnecessary. With this fact in m readily understand how great a saving can be made in t by the use of this machine. We can demonstrate th that our No. 15 can pay for itself in a short time.

Here are a few good points about this new rip saw:

SMOOTH RUNNING

Absolutely no vibration, which is essential in accurate ripping and edging and adds greatly to the life of the machine.

FEEDING MECHANISM

A hand lever at the left of operator controls the starting and stopping of the feed, which consists of two upper driven rolls, and a double endless feed chain in the table on each side of saw, carrying the stock through the machine with a positive straight feed, and leaving it with a smooth edge.

TABLE

A large hand wheel at feeding-in end vertically adjusts the table, which is supported by two screws with ball end bearings.

Our No. 15 is the latest machine of its kind on the market

American Wood W

Executive and

Roche

Sales Offices: New York City, Chicago, Ne

One Operation on Our

Ripping Saw

No. 15 Edging and Ripping Saw

FEED ROLLS LIFT

Feed Rolls are easily and quickly raised and lowered by a hand crank t near the operator.

CAPACITY

ll rip perfectly straight any length and take stock as short as 5" by the intermediate hold down rolls and 14" long with our regular Feed Rolls 26" wide from saw to gauge.

QUALITY OF WORK

will be more than pleased when you examine the quality of work done o. 15—the work will plainly show a higher standard of manufacture cost.

dvance of any other similar idea — write for circular

g Machinery Co.

Office:

Y.

Francisco, Portland, Ore., Spokane

sistance being offered to the flow of formative sap, downwards from the leaves, to this opening, so as to prevent water entering, or spores, or insects.

Safety is the interest paid by an investment in precaution.

Experience is the usual title bestowed by way of excuse on the blunders of a lifetime.

Straightedges are frequently made of redwood and sugar pine because these are easy to work and do not warp or twist badly.

Tops of drafting tables are made largely from basswood, while the trestles supporting them are frequently of sugar maple and Douglas fir.

Billiard table frames are of yellow poplar and chestnut veneered with fine cabinet woods. Rubber cushion is attached to an ash rail. Table legs are commonly of red oak.

In making veneer packages the logs are cut by drag saw into bolts of desired length. A thousand feet, log measure, will cut into six or eight thousand feet of veneer. Bolts are softened in steam and hot water from 12 to 24 hours, and bark removed by hand spuds. Bolt then goes to stave machine. As log revolves, knives slice face of bolt to depth of veneer. The cores are sawed into thin pieces, several being joined with cleats to make a square board, cut round, and then made into bottoms and lids. Hardwoods and waste stave stock go into hoops.

Made by the oldest concern
with the fullest guarantee
write for information
LORING COES & CO. INC.
WORCESTER MASS., U.S.A.

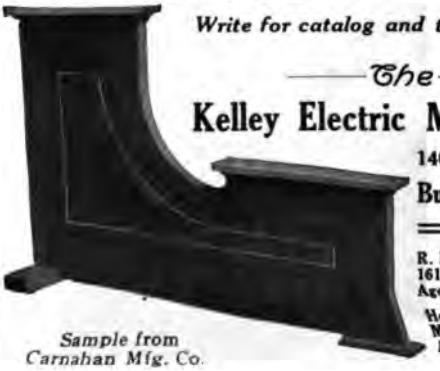
THE ECONOMICAL PRODUCTION OF

Stair Work Column Fluting Inlay Work
Cabinet Work Architectural Woodwork
General Mill Work

requires your mill being equipped with

THE KELLEY ROUTER

THE PORTABLE ELECTRIC TOOL OF 2½ H. P. CAPACITY AND USABLE ON ANY BENCH IN THE SHOP



Sample from
Carnahan Mfg. Co.

Write for catalog and trial proposition.

The

Kelley Electric Machine Co.

1407-1411 West Ave.
Buffalo, New York

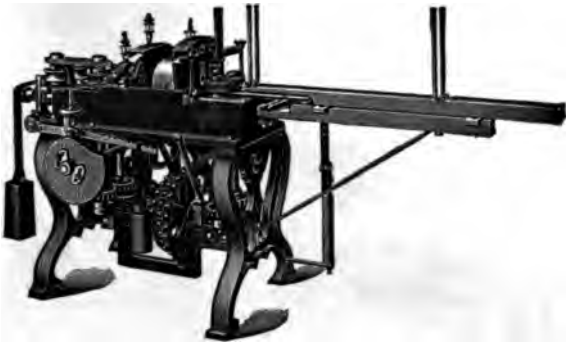
R. L. Scrutton & Co., Ltd., 161 Clarence St., Sydney, Agents for Australia.

Henry Kelley & Co., 26 Pall Mall, Manchester, E. C., Agents for Great Britain.

Broom Handles, Fork, Hoe, Rake, Mop Handles, Etc.

Can be turned most rapidly and economically on the No. 10

OBER LATHE



We also make lathes for turning irregular work

Sanders, Rip Saws, Bolters, Etc.

Write for free catalogue No. 23

The Ober Mfg. Company

***Chagrin Falls*, Ohio, U.S.A.**

TO get the maximum capacity from your Continuous Feed Jointer, you should fit it with the Genuine Morris Wood & Sons 20th Century Solid Steel Guaranteed Glue Joint Cutters.

These cutters will be furnished on your new Jointer if you insist upon it. *Our Guarantee:* Better cutters have never been produced. Our thirty-eight years of cutter-making reputation back this guarantee. Can you beat it? Better get a line on our prices.

Write now for Circular W. C.
It tells all about them.

MORRIS WOOD & SONS

5108-5110 W. Lake St. CHICAGO, ILL.

No. 14 Double Surfacer

Planes 26 inches wide, 8 inches thick

One of our latest designs of medium weight, strongly built, simple, quick, and accurate. Occupies but little space. Built with solid or divided rolls as a single or double surfacer.

Send for large descriptive folder.

Wm. H. Field Co.
Boston, Mass.

Olney & Warrin
New York

L. Power & Co.

6 South 23rd Street
Philadelphia, Pa.

Eby Machinery Co.
San Francisco, Cal.

Zimmerman-Wells-Brown Co.
Portland, Oregon

We make Band Saw Blades of Imported Steel
They Last Longer

WOOD BENDERS!

Here's the Retort That Uses Live Steam Under Pressure

Live steam, under pressure, insures thorough penetration of every wood fibre, making the stock uniformly pliable, and reducing breakage, staining and crimping to a minimum.

We guarantee that Perfection Retorts will reduce your loss, from these causes, fully 50%, whatever that present loss may be.

Although they use live steam, Perfection Retorts are really a dead end to the steam line, requiring only a few pounds pressure when steam is first turned in, until pressure is established in the Retort. The walls are ¾" thick, preventing rapid condensation.

Perfection Wood Steaming Retorts are made of steel, with tightly closing metal doors, having turn screw for tightening them in place. They require but one tenth the floor space needed for the old style, leaky steam box. Perfections are sanitary, fireproof and practically wearproof.

Want to know more? Write for convincing facts or for the retort itself on 30 days' trial.

Made to open at one or both ends—any length.

***Perfection* Wood Steaming Retort Co.**

Parkersburg, W. Va.

Cut Costs!

Our Book Shows You How

Increased output, lower operating and maintenance costs, and minimum fire risk are features attending the use of

Westinghouse Electric Motors

in woodworking plants.

Our book, *Motor-Driven Wood-Working Machinery,* discusses these and many other important points in detail. It contains photographs of actual motor installations, and records of their performance. It will show you how you can accurately check your power costs and will point the way toward economical operation. Every wood-worker should have a copy.

Send for your copy today. It's free.

Westinghouse Electric & Mfg. Co.

East Pittsburgh, Pa.

Sales Offices in 45 American Cities

The Expert Wood Finisher

A Complete Manual of the Art and Practice of Finishing Woods by Staining, Filling, Varnishing, Waxing, Etc.

By A. ASHMUN KELLY

339 Pages *5 x 5½ inches*

CONTENTS

Description of Woods Used in Wood Finishing.
Fillers for Filling Woods.
Finishing the Woods.
Filling and Fuming Oak.
Piano Finishing.
Finishing Veneer Work.
French Polishing.
Stains and Staining.
Various Stains for Various Woods.
Formulas for Staining Woods.
Shellac Varnish.
Flatting Varnish.
Examination and Testing of Varnish.
Varnish Troubles Explained.
Varnish and Varnishing.
Finishing Hardwood Floors.
Furniture Finishing.
Doing Up Old Furniture.
How to Treat Stains, White Spots, Etc., on Furniture.
General Information. A Glossary.

Price $3.00

Cabinet Making

By J. H. RUDD

If you are a worker in wood, whether in the factory or in the school-room, you will be interested.

A book written for the practical cabinet maker, in a practical way. Cabinet Making is not a treatise for beginners, but it will prove as adaptable to the student in the manual training class-room as to the factory worker. Its terse, free style is unburdened with technicalities and offers solutions of your own problems that you can apply in your own way.

Price $1.50

Wood-Turning

Uses of Wood-Working Machines and Pattern-Making

By GEO. H. RESIDES *and* HUGO DIRMER, M. E.

160 pages, 10 x 7, 169 illustrations

Wood-working and pattern-making are more fully treated in this book.

(1) The book is thorough.

(2) It gives a complete series of motion study pictures of wood-turning and wood-working, so that the reader can attain the best results with the minimum of risk and time.

(3) It describes the standard types of wood-working machinery and their uses.

(4) It furnishes a set of detailed working drawings of the sort that emanate from a well-organized drafting-room.

Price $1.50

"Glue Handling" 1

A Manual for the Practical Glue Worker

By FRIMAN KAHRS

Pocket Edition of 180 pages. Blank pages for writing. Flexible binding, two pockets in cover for clippings, etc.

CONTENTS OF CHAPTER 1

1. Knowledge and System Applied to Glue Handling 19-29 Preparatory Work up to 1898.
   Work Done Since 1898.
   Recent Editorial Comment.
   Ancient Methods and Modern Machinery.
   The Glue Testing Problem Now Solved.
   Glue Testing Figures Must Show Practical Working Capacity.
   What the Glue Specialists Should Know.
   Men Needed as Glue Specialists.

Price $1.00

Sent anywhere, postpaid, for the price

WOOD CRAFT BOOK DEPT. CLEVELAND, O.

Get the Most Out of Your Sanding Equipment

YOU will get more work, better work, more uniform results, if the men use Garnet Paper and Cloth that cut clean and fast—show long life, and are uniformly coated with pure, hard, sharp, Garnet grain; in other words,

Carborundum Brand Garnet Paper and Cloth

THE CARBORUNDUM COMPANY
Niagara Falls, N. Y.

New York Chicago Boston Philadelphia Cleveland
Cincinnati **Grand Rapids Milwaukee**

The Phillips "No-Kick" Saw Guard

Ask the workman who has worked on a table equipped with the Phillips "No-Kick" Saw Guard how he likes its protection. He will tell you that he can do faster work and that he is able to give his entire attention to the handling and feeding of the stock with absolute assurance of freedom from injury either from the knife or from pieces of wood flying back.

In addition to the saving of personal injury, this Guard enables your workmen to more freely and quickly handle their work. Order one of these Guards, attach it and try it to your own satisfaction.

The Phillips Manufacturing Co.
Orlando, Florida

WHAT IS THIS?

A Systematizer of the glueroom, some call it. Others say it is a **Common Sense Drier** for Crossbanding and Veneer.

IT IS BOTH!

If we give it away? No, not quite, but we sell it to reputable manufacturers on a blanket guarantee to turn out flat and bone dry crossbanding and veneer quicker and better than is possible in any other way.

Of course, you can get along without. You have done so, your father and your grandfather, perhaps, but maybe it would pay for itself in 15 to 18 months and do away with all your troubles, if you have any in your glueroom.

Tear this out and mail it to

***"MERIT,"* - Lockport, N. Y.**

The

Martin-Barriss Company

Cleveland, Ohio

Importers and Manufacturers of

Mahogany

and all

Native Cabinet Woods

We carry at all times a complete assortment of all thicknesses of Mahogany, Rosewood, Lignum Vitæ, plain and quartered Oak, Cherry, Birch, Poplar, White Ash, etc.

***Kiln Dried* Stock a Specialty**

SAFETY FIRST

Guaranteed when you use

The Ackley Finger Saver

It really protects without one particle of annoyance to the operator.

The Porter Quick Adjusting Shaper Guard or Hold Down

makes your machine so safe to operate that you would be perfectly willing to run them yourselves.

The Porter Jointer Guard

Note the position of the operator's hands on stock passing over the knives. Absolute safety is assured with the Porter Guard.

"Porter Protection" is cheap compared with accident costs.

Send for our new catalog and you will be more than convinced.

C. O. Porter Machinery Co.

660 Front Avenue, GRAND RAPIDS, MICH.

Palmer's Gluing Clamps

The one thing you want to avoid is time-consuming devices.

What you have to do, you want done right and done quickly.

No other gluing clamps made are as practical, quick and sure in their work as PALMER'S CLAMPS.

They are simple and easy to operate and will clamp long stock, short stock and change from one width to another.

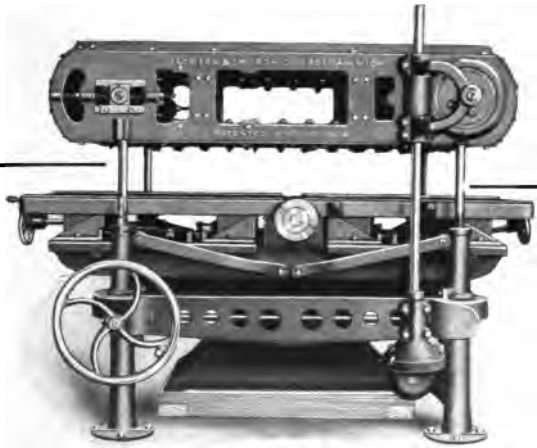
Write to us now and we will show you to your satisfaction that with Palmer's Clamps you can clamp glued stock in the minimum of time, with the minimum of effort and expense, and that with them you get service, speed and adaptability that no other gluing clamp can give.

Ask for full details and prices now.

A. E. PALMER & SON

OWOSSO, MICH.

The Projectile Co., London, Eng.
Schuchardt & Schutte, Berlin, Germany



The Herzog Automatic
Jointer Feeder

Perfect Safety — Maximum Efficiency

THE type shown is for surfacing only; another style swings out to allow jointing and miscellaneous work. **The Herzog Jointer Attachment** has a traveling feed bed fitted with numerous elastic pressure fingers, pressing firmly and evenly on all portions of stock. The upper part of this bed returns to the front all boards incompletely surfaced.

It does better work than the most skilful hand operator and accomplishes from three to four times as much.

Can be set to take out all the wind, or to surface and take out only part or none of the wind.

Will handle stock thick or thin, long or short, wide or narrow, without adjustment or care. Blocks as short as 3 in. are surfaced successfully.

Used by manufacturers of furniture, cabinets, pianos, caskets, refrigerators, toys, sash and doors, etc.

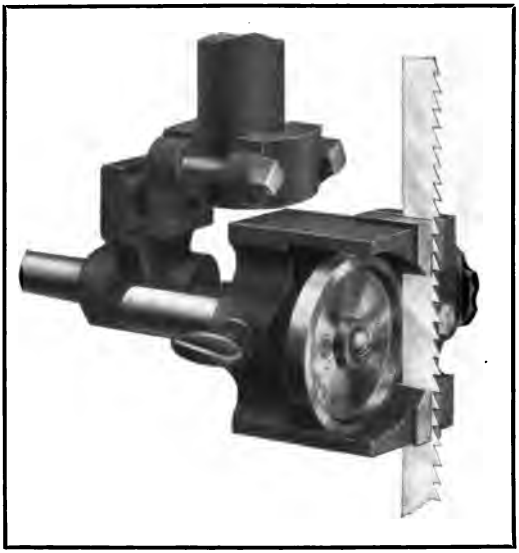
Sent on Thirty Days' Trial.

JACKSON & CHURCH COMPANY

SAGINAW, MICH.

WARNING!

Poor imitations of our Guide are on the market. Avoid any possibility of claim suits by sending us your orders direct.



PATENTED

August 12, 1890 February 10, 1891 March 28, 1891
April 12, 1891 April 25, 1893

We are in a position to furnish you these guides at the same price you can buy the imitation, ***and further, furnish you a guide which we can guarantee.***

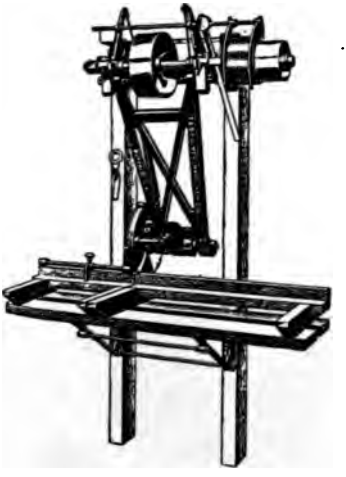
Send us your orders direct for ***Guide Repairs.*** Duplicate parts always carried in stock.

SOLE MANUFACTURERS

The Charles E. Wright Co.

Kenilworth, N. J.

HOLMES No. 68½ SWING CUT-OFF SAW



....COMBINES....

SIMPLICITY, DEPENDABILITY AND GENERAL UTILITY

This Saw is so compact, you can place it anywhere in your plant, and it is made to work either left or right handed.

The Holmes Saw may also be operated by either a hand or foot lever control.

The table is easily raised or lowered to accommodate any thickness of stock.

Put one of these Holmes Swing Cut-Off Saws in your shop exactly where you need it, and you will find that the saving of time alone will pay for the small cost of this saw.

E. & B. HOLMES MACHINERY CO.

33 Chicago St. **BUFFALO, N. Y.**

Sawing newel posts and similar work.

Sawing bevels, such as staves for cylinder patterns, cisterns, tanks, etc.

Sawing out round core-boxes.

THESE illustrations are merely suggestive of the great variety of work which can be done on the **Colburn.**

If you are going to be in the market for a Universal Saw Table get in touch with us.

Colburn Saw Tables are built according to machine tool standards of quality and accuracy—very unusual standards for woodworking machinery. This means better work and more of it.

Colburn Machine Tool Co.

Franklin, - Pa.

The COLBURN Universal Saw Table

is a machine in which the distinguishing features are

SPEED
CONVENIENCE
ACCURACY

Our complete catalog is yours for the asking — drop us a line

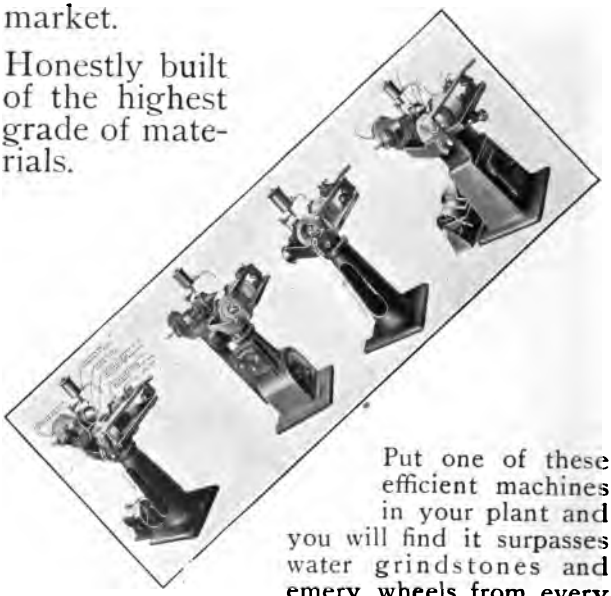
Colburn Machine Tool Co.

Franklin, Pa.

MUMMERT-DIXON

The most effective Edge Tool Abrading Machine on the market.

Honestly built of the highest grade of materials.



Put one of these efficient machines in your plant and you will find it surpasses water grindstones and emery wheels from every view point. The experience of many plants has proven it.

Mummert-Dixon Co.

Oliver Mach. Co., Manchester, Eng.

)ILSTONE GRINDERS

They save time thru their greater efficiency and are made to cover every knife sharpening requirement.

Compact—ever handy—instantly ready to produce any edge.

Our catalog describes in detail the various makes of Mummert-Dixon Oilstone Grinders and their attachments.

Send for a copy and prices. Make your selection and the difference in results will be instantly apparent in your plant.

- - - Hanover, Pa.

Sole Agents for Great Britain

NOTICE

We would like to have all the progressive

Superintendents and Foremen

of all classes of woodworking plants receive

WOOD CRAFT

IN order to have it mailed to you free it will be necessary for you to fill out the blanks below and mail to

Wood Craft

Caxton Bldg. - - - Cleveland, O.

Name .....

Street Address.....

City and State.....

Position I hold.....

Name of firm where I work .....

Are You SAWING Lumber

When You Could Use A

BENDING MACHINE?

SAVE STOCK AND LABOR AND HAVE NO CROSS GRAINS IN STOCK

Write us for prices and cuts of our Hydraulic Steam Benders

Benders exhibited at Chicago Machinery Exchange, Chicago, Ill.

L. G. McKnight & Son Co.

Gardner, Mass.

Fare $3.00

—DAILY BETWEEN—

Cleveland and Buffalo

THE GREAT SHIP "SEEANDBEE"

Length 500 feet; breadth 98 feet, 6 inches; 510 staterooms and parlor commodating 1500 passengers. Greater in cost—larger in all propor —richer in all appointments—than any steamer on inland waters o world. In service June 15th.

Magnificent Steamers "SEEANDBEE," "City of Erie" and "City of Buffalo

Daily—CLEVELAND and BUFFALO—May 1st to De

Leave Cleveland	8:00 P. M.	Leave Buffalo	8:00 P.
Arrive Buffalo	6:30 A. M.	Arrive Cleveland	6:30 A.

(Central Standard Time)

Connections at Buffalo for Niagara Falls and all Eastern and C Points. Railroad tickets reading between Cleveland and Buffalo *for transportation* on our steamers. Ask your ticket agent for tic *C. & B. Line.* Write us for handsome illustrated booklet free.

THE CLEVELAND & BUFFALO TRANSIT CO., Cle

THE UNIVERSAL CLAMP

is a Time Saving, Quick Acting Clamp, especially adapted to Veneering, Paneling, and all kinds of work requiring long, broad jaw.

ASK FOR CATALOGUE No. 252

BATAVIA CLAMP CO.

165 Center Street, Batavia, N. Y., U. S. A.

Loose Pulleys That Earn Money

Sent on trial at our risk.

Wilmarth & Morman
(Nelson Patent)

Your first investment is your last investment when you buy from us.

Actual experience of over 12 years has demonstrated that they will run without being touched, except occasionally for oiling.

Stop trying to repair your old pulleys and put in the kind that never need repair.

Wilmarth & Morman Co. 1182 Monroe Ave., N. W. Grand Rapids, Mich.

WHY TAKE CHANCES?

Accidents on your jointers are absolutely unnecessary and impossible when you install the

CHAMPION AUTOMATIC FLEXIBLE SAFETY GUARD

The money you pay your workmen in damage suits is small satisfaction to them, and an absolute loss to you.

The Champion Automatic Flexible Safety Guard is a simple and sure preventative.

Test one out by writing us today.

Dept. G

CHAMPION MACHINERY COMPANY

JOLIET - - - ILLINOIS

THE GRUNDY COUPLING

FLEXIBLE - - - - INSULATED

The best known means for connecting motors to woodworking machinery, presses, pumps, fans or blowers and machine tools of every description.

CHARLES BOND COMPANY

520 Arch Street :: Philadelphia, Pa.

THE EMPIRE DOUBLE DRUM SANDER

combines massive strength and durability with absolute reliability.

The Empire is always in instant commission and at all times does uniformly satisfactory work.

If price is any object, it will also pay you to investigate the Empire before buying.

W. A. HEATH MACHINE CO.

368 BALDWIN ST. LESTERSHIRE, N. Y.

The Best Groover or Dado Heads in America are

COCKER'S

Sizes 1/8" to 2" or more in width.

YOU will also find the Cocker Shingle, heading, concave, resaws and chisel-tooth saws to be the best on the market. We make knives of every description. They are fully guaranteed.

Write us for prices and complete description

THE COCKER MFG. COMPANY

85 Market Street : Lockport, N. Y.

THE ALLINGTON & CURTIS MFG. CO.

Manufacturers
of

Slow Speed
Low Power
SHAVINGS & DUST
COLLECTING SYSTEMS

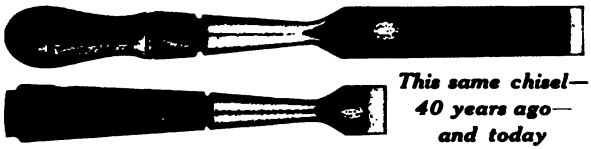
You Can Save Power
by having us install
one of these systems for you

CHICAGO SAGINAW, MICH. SO. BOSTON

WALKER'S IMPROVED STEEL BENCH CAM

is something every woodworker should have. They are as good as a vice and better than a vice for a great many things. They will hold any kind of stock, long or short, thick or thin, and of any shape. They will last a lifetime. Made in pairs, right and left. Every pair warranted. They are used in piano factories and are indispensable for holding down frets and thin panels. Saves nailing them down. Will not split the stock. They are used in cabinet shops, toy shops, furniture shops, and pattern making shops. They are great things for carpenters for inside finishing. Sold by leading hardware houses at One Dollar per pair. If your dealer does not have them you can secure a pair by sending One Dollar to

A. V. WALKER - 707 Main Street - Leominster, Mass.



This same chisel—
40 years ago—
and today

It Took 40 Years to Wear Down This Chisel

and it is giving as satisfactory service today as when first bought.

BARTON EDGE TOOLS

are made even better today than they were 40 years ago.

Specify them. If your hardware dealer should be unable to supply you, send to us for a catalog and our free Story Book entitled "True Stories." It is worth your reading.

MACK & COMPANY

Brown's Race near Platt St. ***ROCHESTER, N. Y.***

Heat is a Great Destroyer of Strength in Glues

A glue dissolving to a light solution at a low temperature loses very little strength.

This most important element is present in COIGNET FRENCH GLUES combined with great adhesive strength.

Light body and maximum adhesiveness are rarely found in the same glue; ours possess this combination to a remarkable degree, giving economy and satisfaction to the user that no others will.

Bad joints and veneering are impossible when the glue is properly prepared and applied.

Try them and be convinced, we are pleased to serve you with samples and prices.

Write us today

COIGNET & COMPANY

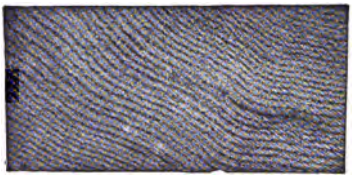
17 State Street : **New York City**

BEFORE USING

Grand Rapids Dry Kiln

Grand Rapids, Mich.

AFTER USING



THE

WEATHERLY

INDIVIDUAL

Glue Heater

Send your address and receive descriptive circular of Glue Heaters, Glue Cookers and Hot Boxes with prices.

The Weatherly Co.

Grand Rapids, - Mich.

Extensively used by the Grand Rapids furniture workers.

SILVER'S NEW JOINTERS

Five Sizes 8, 12, 16, 20 and 24 inch

Built for accurate work as well as hard service. Round safety cylinder can be supplied at slight additional cost.

We also make a complete line of ***Band Saws, Saw Tables and Swing Saws.*** Send for our New Catalog No. 60, which describes in detail our entire line.

The Silver Manufacturing Co.

345 Broadway - - SALEM, OHIO

This is Something You Want!

IT will prevent you from making financial losses, also assist you in securing new customers.

THE RED BOOK

is published semi-annually in February and August.

It contains a carefully prepared list of the buyers of lumber in car lots, both among the dealers and manufacturers.

The book indicates their financial standing and manner of meeting obligations. Covers the UNITED STATES, ALBERTA, MANITOBA and SASKATCHEWAN.

The trade recognizes this book as the authority on the lines it covers.

A well organized Collection Department is also operated and the same is open to you.

Write for Terms.

Lumbermen's Credit Association

608 So. Dearborn St. CHICAGO

ESTABLISHED 1876

MENTION THIS PAPER

116 Nassau St. NEW YORK CITY

Quick-Acting

Self-Locking

Save minutes for your workmen and you will save money for yourself.

A man's time costs just so much per hour; use clamps that will increase his output.

Moreover, TAYLOR CLAMPS cut down the amount actually expended for tools.

A recent visit to the Brooklyn Navy Yard showed that TAYLOR CLAMPS purchased ten years ago were still working, while clamps of the next best make on the market used under the same conditions had worn out in five years.

Catalogue No. 11 shows 22 styles. Free on request.

James L. Taylor Mfg. Co. Poughkeepsie, N. Y.

Progressive or Charge Type

Condensing Lumber Driers

Designed and Constructed by

THE A. H. ANDREWS CO.

Chicago

Are Selected by Those Who Know

BECAUSE:

Their *Temperature Regulation* is perfect and convenient.

Their *Humidity Control* is practical and easy to accomplish.

Their *Circulation* is positive in action and large in volume.

Their *Drying Time* is reduced to practical minimum, owing to constant and correct conditions of Temperature, Humidity and Circulation.

Their Results are ahead of all other Dry Kilns.

Crescent Universal Woodworker

Combines in one, five perfect woodworking machines—**Band Saw, Jointer, Shaper, Saw Table and Borer.**

Each of these are as complete and as practical in operation as if they were separated and scattered throughout your plant.

Combined in the Universal Woodworker, they save you investment, space, time and depreciation. Our catalog shows why. Send for it.

THE CRESCENT MACHINE CO. 22 COLUMBIA ST. LEETONIA, OHIO

"Three Leaders"

No. 7064 Brown Mahogany. For those wishing to secure that rich, dark, antique effect.

No. 7008 Fumed Acid Stain produces a rich Fumed Oak color, any depth or shade desired.

Early English. Our stain powder is the simplest and best from which to produce this pleasing shade.

Full Directions. *Samples on Request.*

Write for our Stain Booklet and Catalog.

Walter K. Schmidt Co.

306 *Monroe Ave.* **Grand Rapids, Mich**

The MEETING PLACE of Employer & Employee

Advertisements under this heading FIVE CENTS PER WORD. Copy must be received not later than the 20th of the month preceding date of issue. If you do not find what you require, let us help you.

WANTED—SUPERINTENDENT FOR FURNITURE FACtory in Indiana. Must be a hustler. Give reference. State experience, age and salary wanted. Address Box 301, care Wood Craft, Cleveland, Ohio.

SUPERINTENDENT WANTED FOR UP-TO-DATE pedestal extension plant. One capable of taking full charge from yard to finishing room. Must understand cost system. Right party may have interest in firm. State salary, experience and reference in first letter. Address Box 300, care Wood Craft, Cleveland, Ohio.

GENERAL SUPERINTENDENT OR FOREMAN WANTS position. Experienced in interior housework, bank, store and office fixtures. Can detail estimate, etc., and practical in all branches. References. Address Box 302, care Wood Craft, Cleveland, Ohio.

WANTED—MACHINE ROOM FOREMAN FOR CASE goods factory near Grand Rapids. Give age, reference, experience and salary. Address Box 211, Grand Rapids, Mich.

WANTED—FACTORY MANAGER TO TAKE FULL charge of new furniture factory, manufacturing cabinet work, furniture or wood novelties. Factory built new in 1913. Must be a man of executive ability, capacity and integrity, able to produce the right quality of goods and market same. Good opportunity for right party. State age, experience, giving references and full particulars. Address Post Office Box 17, Crawfordsville, Indiana.

WANTED—A FIRST-CLASS MAN EXPERIENCED IN he operation of single sticker and four head moulding maines. This is an excellent position and will pay $3.00 to 00 a day, according to his knowledge and experience. ady position and nine hours per day. References. Further *ticulars on request* or can call at plant. Strauch Bros., *'enth Ave., New* York, N. Y.

A WELL-KNOWN BUILDER OF WOODWORKING machinery would add new, salable patented items to its line. If you have an article of use to woodworkers that you want built and marketed, address Box 60, care Wood Craft, Cleveland, Ohio.

MANUFACTURING IN CANADA. THE NEW OFFICIAL register of Canadian Boards of Trade gives complete descriptions of all Commercial Towns with Industrial Opportunities. Indispensable to firms who wish to establish an industry in Canada. Write for free copy; mention Province, Dept. F, Heaton's Agency, Toronto, Ont., Canada.

BRITISH COLUMBIA TIMBER LIMIT, 125,000,000 FEET, principally fir, well watered, on improved river, very close to tide-water. Cruised by owner, who guarantees quantity. Price $1.00 per thousand. Write today, J. W. Ney, 419 Pender West, Vancouver, B. C.

WILBUR R. SMITH

Industrial Engineering

Woodworking plants, box factories a specialty

609 E. 17th St., Alton, Ill.

MAKE BOX SHOOKS

Up to 24 inches long or Loose Barrel Staves of finest quality and at lowest cost from cordwood, slabs, or other forest waste by the use of Gerlach machinery.

The Peter Gerlach Company. **Cleveland, Ohio.**

CHAIR MACHINERY FOR SALE

At a bargain in good condition. Write for list of machines and prices.

Newberry Bros. & Cowell. **Dunn, N. C.**

DOUBLE SURFACER BARGAIN

One No. 6½ American double surfacer, practically new, in good order. Also one double-spindle jumper sander, American. If interested write.

Midland Furniture Company. **Evansville.**

MACHINERY SECTION

Lists of Second-hand Machinery, for Sale or Wanted, will be published in this department at the rate of 35 CENTS A LINE each issue. Minimum charge $3 50. Name and address are not counted in the space charged for. Copy must be received not later than the 20th of the month preceding date of issue.

REBUILT

Woodworking Machinery

Boring machine, 4 spindle, Andrews.
Case clamp 60 x 60 in., Benedict.
Chair seat mitre clamp, Benedict.
Dovetailer, 12 spindle, ball bearing, Advance.
Dovetailer, 12 spindle, Dodds.
Gang dado machine, 4 heads, 2 saws, American.
Glue jointer, 14 ft., invincible automatic.
Hand jointer, 24 in., Clement.
Hand jointer, 16 in., Smith & Rogers.
Mortiser, hollow chisel, Greenlee.
Mortiser, chain saw, New Britain No. 5.
Mortiser, chisel, Fay & Co., with compound table and boring attachment.
Moulders, four side, 9, 7 and 6 in.
Planer, double 30 x 4 in., solid roll, Whitney.
Planer, single 20 x 6 in., American No. 1.
Planer, single 30 x 7 in., American No. 4.
Planer, single 24 x 8 in., American No. 4.
Planer and matcher, 24 x 6 in., four roll, L. Power & Co.
Planer, single 20 x 6 in., Lehman.
Routing machine, H. B. Smith.
Sander, 42 in. triple drum, Young Bros.
Sander, 42 in. triple drum, Invincible.
Sander, 30 in. double drum, Egan.
Sander, moulding, Pioneer No. 1.
Sander, disk and spindle, Fay & Co.
Saw table, double revolving arbor, Whitney.
Saw table, double ripping machine, Grosvenor.
Saw table, railway cut-off, Smith.
Shapers, double, Whitney, American and Fay & Co.
Sticker, 7 in. two side, Hermance.
Swing saws (three) American.
Tenoner, double end single heads and cut-off saw, *American.*
Veneer press, 13 x 50 in., American.

Write for complete stock list.

— Inc. **127-131 N. Third St., Ph**

(24)

CUT PRICES

In Modern Woodworking Machines

Band saw stretcher, Covel 8-in., $45.
Bed clamp, Benedict, $50.
Band resaw, Hamilton 48 x 5 in. saw, $250.
Blower, Sturtevant 25-in. for sawdust, $20.
Circular sawset, B. T. & B., unused, $3.50.
Combination saw, Burlington, $35.
Cut-off saw, Beach, No. 3, box and furniture makers, double, good as new, $100.
Exhaust fan for shavings, Sturvent 35-in., $25.
Glue heater, Francis No. 10, $5.
Jointer, Carey 12-in., good as new, with steel lips, $75.
Lathe, Ober Broomhandle, auto, $50.
Lathe, Klotz, nearly new, spoke and handle, $100.
Lathe, Merritt table leg and baluster auto, $125.
Mortiser, New Britain chain saw with 6 chains, good as new, $200.
Mortiser, Wysong vertical hollow chisel, heavy, good as new, $175.
Moulder, Houston 8-in. 4-side, extra heavy, good as new, $250.
Moulder, Colloday, 10-in. 4-side, $250.
Moulder, Smith 8-in. 4-side, rebuilt, $125.
Panel raiser, Smith upright hand feed, $45.
Planer, Fay & Egan No. 2½, 26 x 6 in., double, $125.
Planer, Superior 24 x 6 Pony Sgl., $75; Frank 20 x 6 Pony Dbl., $100.
Planer and matcher, G. & W. 26 x 6 4-side, $250.
Planer and matcher, Smith 15 x 6 in. 4-side, 6-roll, $250.
Resaw, Goodell & Waters, 24-in., 4-roll, circular, $100.
Resaw, Smith, 36-in., 4-roll, $125.
Ripsaw, Chicago No. 4 hand feed, iron frame, $40.
Ripsaw, 12-foot slide board, $35.
Saw gummer, Rogers Automatic circular, $25.
Sander, Cordesman-Meyer, 24-in., iron frame, hand feed, $50.
Sander, H. D., feed, with 2 drums on one shaft, $25.
Sander, Columbia, 36-in., 3-drum, $450.
Scroll saw, Cordesman-Meyer with 18 saws, $25.
Shaper, Hall & Brown No. 2 double spindle, $50.
Shaper, Hamilton single spindle with 22 reverse cutters, $85.
Siding resaw, McNish & Butler, 24-in., $50.
Stave cutter, Noble 36-in., $75.
Sticker, Fay single head with 4 extra heads, $50.
Tenoner, Fay-Egan No. 2 roller table with cope and cut-off, nearly new, $125.
Tenoner, American Double Heads and copes, $110.
Tenoner, Smith, double end, $175.
Woodworker, B. & M. 8-in. Universal and Combined 8-in. 4-side moulder, $200.
Woodworker, Fay 8-in. Universal, rebuilt, $110.
Window frame machine, Smith & Phillips Perfect, $175.
Woodworker, Fay & Egan No. 77 Variety, absolutely new, $125.

This is only a partial list. We have just bought a furniture factory and planing mill. Machines not listed yet. Let us know what you want. We have it and at very low price.

Woodward Machinery Co. **514 Main St., Cincinnati, O**

FOR SALE
Second Hand Machinery

Automatic cut-off saw (new), $150.
Band resaw lap cutter, Bolton make.
Band resaw, late style, 42-in., $400.
Band scroll and resaw, Fay, 42-in., $275.
Belt, cotton, 12-in., 6-ply, 250 ft.
Belt sander with 14-in. belt, Bein make.
Blind clamp, wood frame.
Borer, multiple, 14-spindle.
Combination rip and crosscut saw, B. & M. make.
Cut-off saw, railway, all iron.
Cut-off saw, double, Beach No. 3, $125.
Door clamp, American, 16 dogs.
Double Arbor rip and crosscut saw, Carey make.
Drawer fitter, Egan, with 42-in. discs, $150.
Emery stands, with countershaft and wheels.
Exhaust fan, 19-in. inlet, Buffalo single, $40.
Exhaust fan, 15-in. inlets, Sturtevant double.
Gang rip saw machine, 6 saws, $135.
Grind-stone frame, with 30-in. stone.
Gummer for circular saws up to 30 in.
Hoop Mch., full set, Defiance, 4 mchs.
Jointer, hand planer, 24-in., Egan.
Lathes, for hand turning, 16-in., complete.
Lath saw bundler and equalizer.
Molders, 4-in. 1-side, 6-in. 1-side.
Molder, 9-in., Fay & Egan No. 14, wide open.
Molder, Lehman, 8-in. 4-side, good order.
Mortiser, Houston, cabinet size, $50.
Mortiser, Smith make, heavy, $65.
Mortiser, Egan, grad. stroke, extra heavy.
Mortiser and borer, Cordesman make, $75.
Planer and matcher, 24-in. 3-side, small.
Planer and matcher, 24-in. 3-side, medium.
Planer and matcher, 15-in. 4-side, $250.
Planer and matcher, 24-in. 4-side, Fay No. 2½.
Planer, dbl., 30-in., Hoyt, weight 10,000 lbs.
Planer, dbl., 24-in., Goodell & Waters.
Planer, 30-in., No. 4 smoother, with counter.
Planer, double, 30-in., No. 180, Berlin.
Pony planer, 24-in., Cordesman-Meyer.
Post borer, with table and treadle, $20.
Resaw, circular, 24-in. saw, $85.
Resaw, 4-roll, 24-in., Egan circular.
Sander, Egan 30-in., 2-drum, 8-roll.
Sander, 40-in., Perry make, 2-drum.
Sander, Fay & Egan, 3-drum, 42-in.
Sander, Fay & Egan, 36-in., 3-drum, $350.
Sander, single spindle, all iron, $50.
Self-feed rip-saw, Hoosier, C/S.
Shapers, single spindle, reverse C/S, $60.
Shapers, double spindle, all iron, $75.
Shapers, double spindle, pedestal frame.
Spoke lathe, Egan, 42-in., No. 22.
Spoke lathe, Defiance, 32-in., $250.
Swing saws, all sizes, $25 each.
Tenoner, B. & M. dbl. hds., cut-off saw.
Tenoner, Fay, single head, slide table.
Universal woodworker, with vertical spindle, Bentel & Margedant make, $135.
Variety woodworker, Rechtin, with borer.
Woodworker, 10-in. and 8-in. 4-side, molder combined.

Louis E. Rechtin & Bro. **215 Butler St., Cincinnati**

FOR SALE

Used Woodworking Machinery

Band saws, 36-in. Crescent, 36-in. West Side.
Borers, 2-spindle hor., 1-in. to 12-in. Valley City, 1-in. to 6-in. B. & M.
Borers, vertical, single spindle, 4 M. L. Andrew, 1 Clement.
Carver, Buss with bench.
Dovetailers, 9, 12 and 24-spindle, Dodds.
Edger, Fay & Egan, wood frame, 10 ft. long.
Grinders, knife, B. T. & B. and Rogers, 44 in. cup wheel.
Jointers, 20-in. G. & K., 24-in. Cordesman, 12-in. Clement.
Jointer, 30-in. Bentel & Margedant, with power feed.
Lathes, 16-in. Porter, common.
Molders, outside, 4-in., 6-in., 7-in., 8-in., 9-in. and 10-in.
Molder, inside, 12-in., Fay & Co.
Planers, single cabinet, two 30-in. Dennis, 30-in. Buss.
Planer, single, 26-in. x 7-in. Clement, double belted.
Sanders, Smith, hand feed, 30-in.
Saws, tilting table, two American No. 1, Egan.
Saw, double cut-off, 6 ft. 6 in., Buss.
Saw, heavy rip, Fay & Egan, for 30 in. saws.
Saws, Rowley & Hermance; Fay & Egan comb. saw and dado.
Shapers, single spindle, Boults, American.
Shapers, double spindle, Indiana, Buss.
Tenoners, H. B. Smith, roller table.

Ask for Complete List.

The Chas. A. Strelinger Co.

Woodworking Dept. **96-110 Bates St., Detroit, Mich.**

FOR SALE AT GREAT SACRIFICE

Planing Mill Machinery

1 iron frame swing cut-off saw, $20.
1 120-light electric generator and equipment, D. C., $125.
1 4½ x 2¾ x 4 Duplex pump, $30.
1 Williamsport No. 2 scroll saw, $50.
1 R. & H. combination saw and dado machine, $125.
1 R. & H. post boring machine, $15.
1 No. 129 Fay-Egan planer and matcher, with full sets Shimer heads, for flooring and ceiling, $700.
1 No. 2 30-in. circular resaw (heavy), $200.
1 Fay-Egan 4-in. sash sticker, $75.
1 Smith chisel mortiser, $40.
1 Fay-Egan panel raiser, $50.
1 Fay-Egan arm sander and dust collector, $50.

We have a complete line of Shimer heads for all the latest patterns of sash and door work, ceiling, flooring; and this machinery is in first-class condition. It is offered at these very low prices in order to close it out quickly.

Have It Examined

We will be glad to have you come in person and examine this machinery. If it is not convenient, you could secure the services of an expert by writing to either of the following reliable Chattanooga concerns: The Chattanooga Machinery Co., The Wheland Machine Works, The Patten Mfg. Co., Gladdish Bros., Machinists, or Street Bros. We will sell the above in part or will consider cash offers on the whole.

Write or see

Forger Bros., Agents. **Chattanooga, Te**

BARGAINS EXTRAORDINARY

WOODWORKING

1 10-in. 4-side molder, Colloday.
1 36-in. automatic knife grinder.
1 16-in. hand jointer, Goodell & Waters.
1 Alber stair router.
1 30 x 6 J. A. Fay & Co. double surfacer, divided feed rolls, cabinet type, A-1 condition, $300.
1 30 x 8 Money Maker double surfacer, weighing about 10,000 lbs., A-1 condition, $400.
1 15-in. 4-side inside matcher, J. A. Fay & Co. make, fine condition, $250.
1 7-in. 4-side Holmes Atlantic inside matcher in fine condition, $200.
1 15 x 6 J. A. Fay & Co. inside matcher in fine condition, $250.
1 15 x 6 J. A. Fay & Co. inside matcher in fine condition, $350.
1 24 x 6 planer and matcher, 4-side.
1 2-saw edger, 24-in., in fine condition, $50.
5-Cabinet single surfacer.
2 Tenoning machines.
2 Double cut-off saws.

SPECIAL BARGAINS IN SANDERS

1 42-in. 3-drum Perfection sander, thoroughly overhauled, $350.
1 48-in. 3-drum Thomas sander, $400.
1 48-in. 3-drum H. B. Smith sander, $500.
1 54-in. 3-drum J. A. Fay & Co., fine order, $500.
1 48-in. 3-drum Royal Invincible sander, $550.
1 60-in. 3-drum Columbia sander, in A-1 condition, $600.

JOINTERS

1 18-in. Crescent hand jointer.
1 16-in. Goodell & Waters hand jointer.
1 18-in. Crescent hand jointer, in A-1 condition, $90.
1 30-in. Buss extra heavy hand jointer, $125.

Woodworking machinery of all kinds.
Write, stating your requirements.

CLEVELAND BELTING & MACHINERY CO.

1922 Scranton Road, Cleveland, Ohio

BIG MACHINERY SALE

The Stock and Business of Hanna-Brackenridge Co., Fort Wayne, Ind., Sold by Trustee

A machinery deal of more than ordinary interest was the recent sale of stock and business of Hanna-Brackenridge Co. to a new concern, who will continue the operation of the business at the old stand in Fort Wayne.

The new company is **Wayne Machinery Co.**, and officers and directors are as follows:

Geo. H. Van Arnam.
Nathan Rothschild.
W. L. Fridell.
A. N. Cruser.
Theo. Wentz.
F. H. Poole.
J. E. Elliott, Sales Manager.
J. E. Monhan, Factory Manager.

The sale includes entire stock of over six hundred machines, including Saw Mill, Planing Mill, Box, Furniture, Hoop, Stave, Heading, Wheel, Body, Sash, Blind, Engines, Boilers, Electrical, Iron Tools, and machinery equipment of every sort.

A special feature of the new concern is overhauling of second-hand equipment and the sale of same to responsible concerns under plan that eliminates the risk usually attending the purchase of second-hand machinery.

New equipment is also carried in stock in large quantities of the most improved types and their facilities for taking care of the trade should be all they claim.

We succeed to a business organized some fifteen years ago with the prime purpose of dealing in used machinery, furnishing same overhauled and in shape to give same service as when new.

The stock of over six hundred machines is to be greatly reduced and quickly. To accomplish this we are in a position to name especially attractive prices on standard dependable machines of all sorts.

A fifty-page booklet, to be known as "Wayne List," will be issued monthly, listing all machines actually on their floor for sale, and it is to be mailed to the users of any kind of machinery. We would be glad to have your name for this publication.

The *experience of men in* charge of this business, together *with personnel of the* Board of Directors and the evident *facilities should merit* the consideration and confidence of the *trade.*

6087

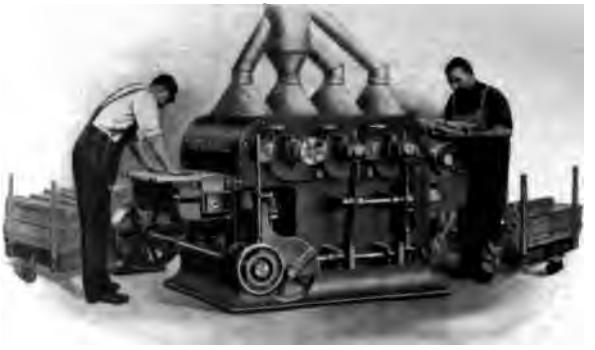
ESTABLISHED 1847

[redacted]

INCORPORATED 1878

Woodworking Machinery

SMITH'S PATENT **Triple Drum Sander**



PATENT ENDLESS-BED SANDER
WITH QUADRUPLE HOODS

Guaranteed to be the Best

SEND FOR LITERATURE

H. B. SMITH MACHINE CO.

SMITHVILLE, N. J., U. S. A.

New York **Chicago** **Atlanta** **San Francisco**

ockford Pneumatic Rubbing and Sanding Machine

WHETHER you work on large or small surfaces this machine will save time, give you uniform sanding, and enable you to work clear into the corners.

The Rockford Pneumatic Rubbing Machine is also adapted for sanding, as the blocks are quickly interchangeable.

Ask us for the names of firms using this machine, and find out direct just how well satisfied they are.

IE ROCKFORD TOOL COMPANY

Rockford, Ill., U. S. A.

Your Mortising Work

will show a profit instead of loss if you use the

Chain Saw Mortiser

It reduces your mortising time 80% because of its continuous cut.

YOU WILL—

Save on your workman's time,

Save on your investment,

Secure more uniform and better work when you use the *Chain Saw Mortiser.*

Put it up to us to show you how and why.

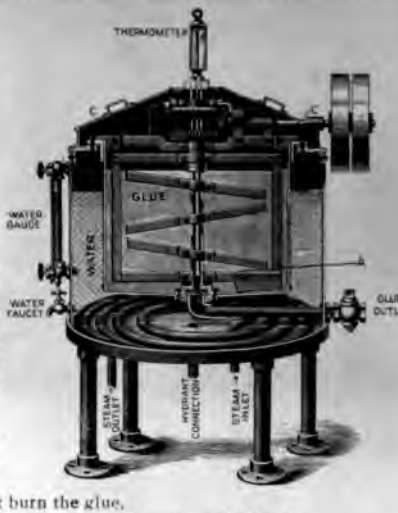
The New Britain Machine Co.

16 Chestnut St. **NEW BRITAIN, CONN.**

WOODCRAFT

MAY —— 1914

Latest Improved Glue Heater



After all has been said about different glue heaters, instantaneous glue converters, or glue cookers, whatever they may be called, the most experienced glue user—the most practical man—prefers:

A Heater that does not allow the steam to come in contact with the glue.

A Heater that will not burn the glue.

A Heater that does not carry too much moisture to the glue.

A Heater in which the water in the outer tank is always pure.

A Heater in which the glue can be stirred.

A Heater that has a practical stirrer or agitator.

A Heater that preserves the glue in every way.

A Heater suited for any capacity within its size.

A Heater that prepares the glue quickly and wastes no time.

A Heater that consumes very little steam.

A Heater that does not annoy with escaping steam or vapor.

A Heater that prevents a wet, sloppy floor.

A Heater that truly and accurately registers temperature of glue itself and shows it at a glance.

A Heater that is durable, convenient and economical, and withal, of a reasonable price.

That briefly accounts for the popularity of the cooker shown here, which is in extensive use and is given the preference by the large panel plants and most experienced users of glue.

Cut shows Glue Heater with patented glue thermometer attachment, copper steam coil and double acting glue stirrer—the only practical stirrer or agitator in use. Inside, or glue tank, of heavy copper or heavy galvanized plate or cast iron, as desired. It can also be fitted with Automatic Temperature Controller to turn the steam on or off as regulated.

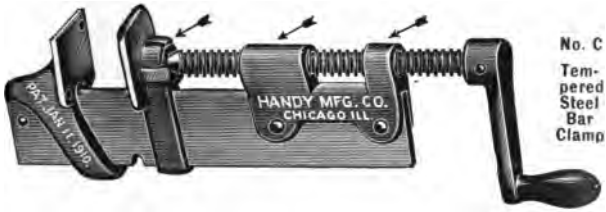
CHAS. E. FRANCIS CO.

Largest Manufacturers of Glue Room Equipment

Main Office and Works - - - **RUSHVILLE, IND.**

Handy Clamps are Better

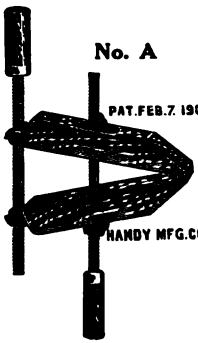
No. F
Screw is 2 inches above Tempered Steel Bar



No. C
Tempered Steel Bar Clamp

Tempered Indestructible Steel Bar Clamps. Screw works in two bearings, increasing the life of the clamp over 100 per cent.

"Handy" Patented Steel Spindles and Steel Nuts on "Hand Screws" guaranteed not to break.



No. A

Can be kept rigid or attached in any position.

Strongest Hand Screw Made

Works nearly ***twice as fast*** as common wood screws. Spindles have a right and left hand thread. Gives a tighter grip and less power required. Glue cannot stick to spindles. Handles guaranteed not to get loose. Jaws are best seasoned maple.

Try our "Mitre" Clamp also our "Frame" Clamp.

....ORDER SAMPLES....

Send for Catalogue and Prices of Full Line of Clamps

HANDY MFG. CO.

27 E. Madison St. CHICAGO

Si-monds Manufacturing Co.

HIGH SPEED STEEL KNIVES

Made and heat tempered in the most scientific manner.

WRITE FOR PRICES

Simonds Manufacturing Co.

Fitchburg, Mass.

17th St. and Western Ave. Chicago, Ill.

Published by
THE GARDNER PRINTING COMPANY
CAXTON BUILDING · CLEVELAND, OHIO

VOL. XXI | MAY 1914 | No. 2

WRINKLES FOR WOODWORKERS

Blunt cutters mean dull operators.

Elm is a favored wood for flour barrels.

Wide set teeth eat big into sawn stock and profits.

The maker of bad breaks needs to be a good repair man.

Things that fail to come one's way are waiting to be met.

It takes two to make a bargain and both should *profit by it.*

The shorter between the pulleys and the longe *the bills for belts.*

Getting one's nose to the grindstone is another way of sharpening.

Of course the towering rage is always headed for the tall timbers.

Box or screen any motor starting boxes, especially when near floor.

Sugar maple is light, strong, hard, elastic, and a lot of it goes into sleds and sleighs.

It's a wise plan to fix the belt shifters so that they hang vertically when belt is on loose pulley.

Hearing of a good remedy for a blunder deafens the hammering of any criticism that went with it.

Quantities of box shooks are made from planing mill material that once went as waste to the dump.

That item in April issue reminds a correspondent that James Monckey invented the monkey wrench. hence the name.

A grim description was offered by the loser of several fingers on the saw when he said it was like shaking hands with lightning.

Bits of hard maple, once the irredeemable offal of furniture factories and door plants, are now going into chair legs, toys, and knife handles.

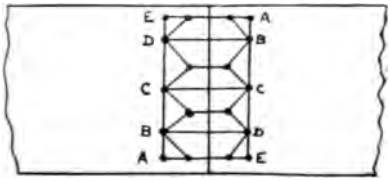
Neatly glued splices in belts are safe; well laced joints with rawhide come next, but hooks sometimes prove a snare whereby the unwary may suffer.

Spruce, basswood, birch and ash are useful for the interior work on refrigerators and kitchen cabinets because in coming in contact with food these woods impart no stain nor cause any offensive odor.

THE LACING OF A HIGH-SPEED BELT

Lacing a belt so that it is same on both sides and is then claimed to have unusual degree of efficiency

BELTS when at their best have pliability to hug the pulleys close, possess a maximum grip of the pulling surface over largest possible area, have joints that are easily made or unmade and yet retain greatest practicable strength with least increase in dimensions, and to these and other advantages may be added long life, continuous maintenance of high duty, and of course



A Curious Belt Lacing That Has Made Good

possessing cheapness in first cost and upkeep. Having these, the rest follows.

But the average experience of belts is not always of this class and there's mighty little rest around loose. Every once in awhile comes a suggestion that shows how the facts are fitting into other shops. Here is a sketch from the "Brass World," where a high speed belt has an odd lacing. Claim is made that it is durable and quickly made but is advised only for belts eight inches or more in width as it is too elaborate for smaller belts.

We prefer a cemented belt, but conditions won't *always permit their* use. Then we want the short

est possible lacing. Long laces add that much more to the chances of the belt pulling a little apart at the joint. There is just that much additional opportunity for the lacing to stretch and to settle down into smaller compass when put under working strains. Separation at the joint is also unsafe as well as mechanically unsightly. To be sure, the lacing must be long enough to hold good and strong.

However, the unique feature is that that lacing as illustrated is same on both sides of belt. On the other hand the angles and triangles offend that common shop conviction that all lacing should be straight on pulley side. Yet it is claimed that it always gives satisfaction, runs smoothly, and outwears any straight-laced style of lacing.

Another common practice is with a double row of lace holes to put the larger number nearest to end of the belt. Note, therefore, the four holes at edge of belt and end and the five holes back of the four. Method of lacing is not explained any too thoroughly but is said to start at middle of belt and that each end of lace finishes at E on each side. "Holes A, B, C, D and E are laced once more, then if all the other holes are double-laced the holes mentioned are laced two or three ply." Joint is then smoothed down with a wooden mallet, and there you are.

Vol. 5 in a series of textbooks of practical mathematics deals with trigonometry and has 242 5¼ by 8-inch freely illustrated pages planned to give a *clear, rational* and usable knowledge of it for *industrial purposes.* Published by John Wiley & *Sons, Inc., New* York, N. Y. Price, 1.50.

PLANER KNIVES—THEIR USE AND UPKEEP

States the shop requirements of knives and advises the purchaser how to make proper selection of abrasive wheels to keep them in fine cutting condition

ORDINARY planer knives are made in many shapes, for plain work to all sorts of beaded moldings, but generally the molding is done with a side-head attachment. A wheel doing splendid work grinding bits for the side-head is an aloxite wheel in 403 grit.

We are further told by the "Abrasive Age" that high-speed planers now manufactured by all the woodworking machinery companies cut stock as fast as 200 feet per minute. Heads run as fast as 3600 feet per minute, and the knife is 15 inches long, 2 inches wide, and ⅛ inch thick, made of solid tool steel. Knife has double-beveled edge, bevel a little on one side, the back being beveled just enough for relief. This is more of a scraping operation than cutting, but is very successful, especially in flooring plants.

For truing or jointing these knives there is a truing device that holds a carborundum or aloxite stone in 180 grit. The jointing is done while the machine is running slowly, the carborundum stick traveling the length of the knife, truing it as it passes.

The knives are ground on machine that carries two wheels, one on each side of knife, or in some cases on a grinder having a cup wheel, the knife being clamped in holder adjustable to any bevel desired. Best wheel for this work is an aloxite wheel in 50 grit.

PROMOTION OF CABINETMAKING SKILL

Encouraging the ambitious in practical construction

AN association has been formed in Ghent to foster a little rivalry, or rather a friendly spirit of emulation, among native artists and artisans. Prizes were offered for work to be done by those whose talents are used in the interests of various industries and the competition was limited to young Belgians. Plans were made to have this a yearly contest. Specimens submitted by contestants for the awards were sometimes restricted in cost, the idea evidently being to encourage the design of those things which could be of a practical sort, and likely to be of a merchantable type. Under the head of cabinetwork and furniture are found the following articles to be made in wood: A library chair that could be sold for $3.60; an armoire, 7 by 6 feet, with glass doors for holding porcelain or silverware and having no restrictions as to style or kind of wood. Scheme seems well adapted to boost the technical and artistic tendencies of ambitious workmen.

Box factories are choking off waste, especially in the large cities where even the sawdust is salable for packing purposes, sweeping compounds, bedding for stables, composition floors, tanneries, fur dressing, and sound deadening between floors.

Making one thing is less common than formerly, many manufacturers holding that the production of *one commodity* offers fewer chances to economize *as closely in* material as the turning out of miscellaneous goods.

THE CLARAGE FANS AND BLOWERS

FANS, blowers and exhausters are described in the new catalogue of the Clarage Foundry & Mfg. Co., Kalamazoo, Mich. These are in numerous variety, engine or pulley driven, steel plate construction, having special bearings with dustproof oil reservoirs, and include a

Double Machine of Clarage Construction

line of small fans, exhausters for handling shavings, dust, etc., and volume or pressure blowers. Company makes coils as well as other apparatus for hot blast factory heating or for blower drykilns.

Direct-current motors and some interesting examples of their usefulness are shown in a recent *bulletin from the* Sprague Electric Works of the *General Electric* Co., 527 West 34th street, New *York, N. Y.*

can use the machine without
with each other. One is sharp
while the other is gumming
chine occupies very little floor space
process of tool grinding can be

machi
stroppi
on the
Saw
usually
task ar
working
with t
scheme
the ma
machine
easy, sp
curate.
drive i
conveni

SAFETY OF SHAFTING, BELTS AND PULLEYS

Accidents have happened in unexpected places and these pointers have often proved very effective for lessening the number of such regrettable mishaps

SIZE and speed of shafts are not always good guides to their dangerous possibilities. A 12-inch shaft, smooth and apparently inoffensive, and another one turning at less than twenty rotations per minute, have caused fatal acci-

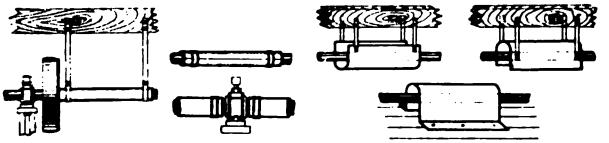


Fig. 1 Fig. 2 Fig. 3

Fig. 1. Sheet Metal Tube and Pulley Disk
Fig. 2. Shafts Encased in Cardboard Tubes
Fig. 3. Sheet Metal Troughs for Shafting on Floor or Ceiling

dents. To prevent anyone coming in contact with shafting is the essential thing.

Shafting at seven feet above the floor level may seem to be out of the danger range, but even here they can come within risky reach of those whose duties demand their approach for such purposes as lubrication of bearings, cleaning, care of belts, etc.

In these cases the shafting can be suitably guarded, or provision made for halting or slowing its operation as the requirements may demand. *When adjusting a belt*, for example, a very slow *speed can be most* helpful and practically dev-

of danger but care should be taken to have a system of quick signaling to bring everything to a prompt stop at any sign of trouble.

Shafts may be cased in wholly or in part at danger points by sleeves, fixed or loose, or by guard rails. Sheet metal and cardboard are easily arranged in tubes as in Figs. 1 and 2. Note that in Fig. 1 there is additional protection against the pulley spokes by a disk attached to the metal tube. There are instances where the disk could preferably be fastened to the pulley itself. Fig. 3 illustrates metal troughs. Fig. 4 shows wood casings for vertical and horizontal shafting. Tubes and casings can be attached by brackets to the nearby bearings, walls, beams, and flooring.

Even a loose tube slipped over a shaft has been found to serve as a guard, it stopping when anyone comes in touch with it. Tube can be split to go over the shaft and then joint is fastened by wire or metal clips which should be free of all projections when applied.

Complete casings surrounding the shafts are preferable unless deep troughs of wood or metal are used. A board under or over the shafting or even a shallow trough is not safe, and serious accidents have occurred where shafts have been protected on two or three sides only.

Guard rails are necessary where the shafting is low and the pulleys are many. Then the shaft cannot easily be encased. Rails should not be too far apart. If distance is too great a person may get within rails, and if distance is too limited then the *clothing or other* material may catch the shaft or *an accident* occur by anyone falling against the rail. *bout twelve* inches is probably right.

Rails for shafting guards are often temporarily used to stand upon and therefore ought to be proof against bending under a person's weight.

Low lines of shafting fenced off by rails should have gangways or steps at suitable intervals where it is necessary to cross them. Handrails can be provided at these points as in Fig. 5. Where the shafting is high enough to allow passage under it,

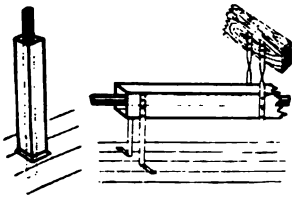


Fig. 4

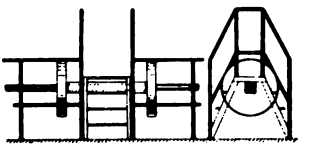


Fig. 5

Fig. 4. Wood Casings for Horizontal and Vertical Shafting
Fig. 5. Two Views of Fencing with Steps and Handrails for Low Shafting

say any distance short of 78 inches, shaft and pulleys should be enclosed.

To oil, clean, or adjust, requires from time to time the approach of workmen to shafting. High or low as the places may be the need is there. It is a want that should have regular attention. Difficulty of access is one way of guaranteeing negligence and thus of making it permanent. An overhead platform can be conveniently arranged, yet may be at a safe distance and have guard rails at, say three feet high, with a vertical board at edge of platform to keep tools from falling on the passersby.

Here, too, is a reminder that a lost wrench left *on beams near a countershaft* has been known to

find itself with disastrous consequences when the vibration of the machinery finally jarred it loose from its resting place and sent it down upon the head, arm or shoulder of an unfortunate located underneath this trappy affair.

Ladders are sometimes provided with an inverted trough which rests on the shaft and thus temporarily fences it off from contact with the workman's clothing, etc. This requires ample space between the pulleys, bearings, and couplings. Ladders should not be too long, neither too short, if used for purposes near shafting. A long ladder is unnecessarily awkward in finding safe adjustment to a secure resting place, and a short ladder calls for too nearly vertical an angle for satisfaction. Feet of ladder should be incapable of slipping along floor. User of the ladder must also keep his hands sufficiently free from all other requirements so that he can hang on properly. A ladder is not a good substitute for a power hoist.

DISCOLORED KEYS ON PIANOS FOUND DUE TO STAINING OF STOOLS

Dealers complained to a New York manufacturer in regard to the discoloration of piano keys, the ivories turning pink. According to the Music Trades an investigation of the trouble led to the conclusion that the difficulty was the result of improper staining of the inside of the stool tops. In drawing the stool up to the front of the piano, the moist fingers of the player transfer this stain from *the inside of* the stool to the ivory keys. It is suggested *that* the stain be given a shellac coating as *a protection* at the point of frequent handling.

WRIGHT NON-FRICTION ROLLER GUIDES

CHARLES E. WRIGHT CO., Kenilworth, N. J., tells us that it has made some 150,000 non-friction roller guides and possesses seven patents on these improved devices originated by the above company. That the company is ever busy at work seeking to better its

Some of the Wright Non-friction Roller Guides

product is shown by the recent issuance of another patent to it under date of March 4, 1913. A general sales office and showroom has just been opened at 355-357 Market street and 168-170 Commerce street, Newark, N. J., where a full line of the company's products will be carried with a standard line of woodworking machinery.

A couple of suggestions are offered in the "Building World" on the making of waterproof glue. First dissolve ½ ounce mastic and ½ ounce gum sandrach in ½ part spirits of wine, then add ½ ounce of turpentine and some strong glue. Stir together over a slow fire, strain through a cloth, and bottle for use. To make ordinary glue waterproof, add a small quantity of tannic acid dissolved in water to the hot glue, and well mix.

A NOVELTY IN MITERED LAP JOINTS

Proposes a way or two of making joints of novel type for the better security of frames for cabinetmakers

POINTS here illustrated appear to be original. As will be noticed, they have particular value in framing up a variety of small work—from about two to one inch, or even three-quarters and half-inch—such as interior fittings of all descriptions, including partitions, showcases, sash, counter lights, or even doors.

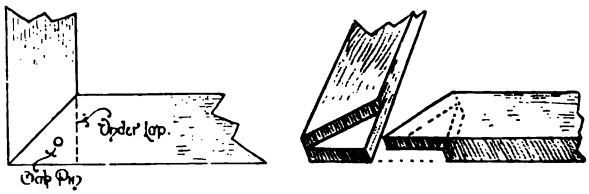


Fig. 1. Suggestion for a Mitered Lap Joint

A fault with the ordinary miter-joint, points out the contributor—an architect—in the "Building News," is liability of springing, from time to time. This is particularly so when wood is not thoroughly seasoned. It even occurs with the angle tenon-joint, unless tongue is deep enough to admit of pinning through.

With narrow stock it is also practically impossible to utilize latter plan, as it involves thickness being split into three, which will warp again if insufficiently seasoned. Methods illustrated only split material *in two,* while at same time they are simple. *Figs. 1 and 3* can be quickly formed with a couple *of sawcuts.*

Fig. 1 is secured with a single oak pin, and o

also be further secured with a couple of thin screws —one on the diagonal and the other through bottom joint. Fig. 2 is similar. It can be jointed straight

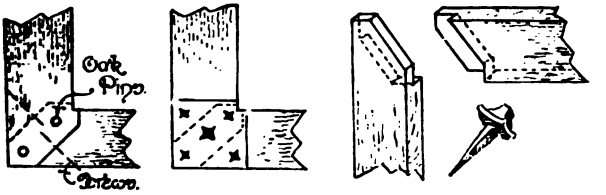


Fig. 2. Method of Making Mitered Lap Joint with Cover Plate and Decorative Nails

from the inner angles, out of same width as side-pieces, if preferred. Latter method is also illustrated by Fig. 2.

Another method is to cover the angle in addition with a quarter to a half-inch stiffener, according to

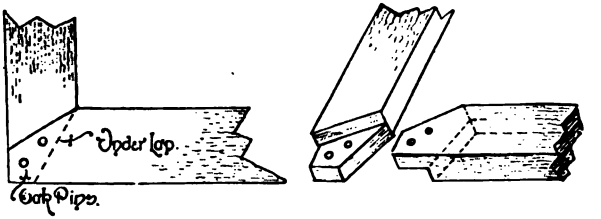


Fig. 3. This Joint Centers the Pins, but Otherwise Is Not So Symmetrical As the One in Fig. 1

thickness used. Latter has quite a picturesque appearance, with sash or doors, when spiked with large-headed nails as per sketch. Fig. 2 joint involves chiseling, and, therefore, is not so quickly formed as Figs. 1 and 3.

The latter joint, Fig. 3, is similar to Fig. 2, but without same binding capacity. However, it admits of a more quickly-formed joint, either pinned or screwed together on angle from back to front, and vice versa, also the introduction of a little nail-head work on angle line. Latter is sometimes desirable. Fig. 1 has its advantages in giving a straight mitral joint at angle, when symmetrical appearance is required for facing work, and is easily machine-cut.

MATCHING METAL TRIMMINGS TO WOODWORK

Furniture designers and cabinetmakers as well as millmen have often experienced difficulty in getting exactly the right shade on the metalwork to match the wood they had planned to use, and this article shows how some ingenious craftsmen have made the metal finish to satisfactorily fit their wants

HARMONY makes it often necessary for the metal ornaments on woodwork and furniture to be of a color differing materially from that found in staple products of trade. Following hints are translated from the "Deutsche Tischler Zeitung."

Most common finishes desired are old brass, old silver, iron color, old iron color, dull gold, bright brass, and steel blue. No special equipment is needed and only processes are given that need no galvanic current. Fundamental conditions for production of the tones are practically same as for wood finishes. Metal surfaces must be clean, otherwise tone will be spotted. Stock metal parts are coated with protective lacquer after coloring, to prevent oxidation, and this coating must be dis

solved before applying new finish. Before coloring, the metal parts must also be given smooth surface by abrasives—as medium coarse emery-paper, brushing with a brass wire bristle brush and pumice-stone flour or by dipping the pieces in a solution which will give the pieces a uniform grain. Pieces while still wet and free from oil or grease are then brought into coloring solutions.

Simplest of these is Old Brass: To solution of 1 liter hydrochloric acid add 10 grams arsenious acid (H_3AsO_3) and 10 grams of iron or green vitriol or ferrous sulphate. After complete solution add 1/10 liter iron chloride and 1 liter water. Entire mixture is vigorously shaken and is then ready for use. This composition is used for old brass, old silver, iron, and old iron colors.

Old Brass: Metal pieces after cleaning are put into above solution. Touching the metal parts with a narrow strip of zinc covers them with a steel gray to dark gray coating. After removing pieces from liquid they are rinsed in water and then a coarse bristle brush or a fine brass brush with powdered pumicestone is used to make coating uniform so brass just about shows through. Process is repeated till desired tone is reached, when pieces are washed in fresh water and dried in soft sawdust.

Iron: Same process as above, only that the gray colored pieces are not rubbed with pumice but with a rough brush in one direction, giving a steel gray tone, whereas pieces when first leaving bath are dull.

Dull Gold: Following solution is needed: 100 *grams of potassium bichromate* are dissolved in 1 *liter water and 60* ccm. pure sulphuric acid adde

After finely powdered bichromate is dissolved, liquid is ready for use. Brass pieces are left a few minutes in solution, taking on a beautiful dull gold color similar to real gilding. Pieces are then drawn through a 10 per cent sulphuric acid solution and washed in clean water and dried in sawdust.

Old Silver: Metal pieces are dipped in first solution mentioned, receive a gray finish and are then washed and coated with some silver paste. Gray deposit disappears in part and mixes with a silver tone. Pieces are then washed and dried.

Steel Gray: These shades can be obtained by dipping metal objects in an almost boiling solution made up of: 500 grams water in which 15 grams sugar of lead (lead acetate) are dissolved. In a separate flask dissolve 45 grams sodium hyposulphite (hypo) in 250 grams of water. Both solutions are poured together and heated to boiling. Brass colors in this hot mixture as follows: first brownish, reddish violet, steel blue, finally light blue. Any of these colors can be retained by taking work out of the bath, washing and drying in sawdust. Metal pieces after coloring must be coated with a lacquer for protection against oxidation.

Forest Products Exposition opened April 30 in the Coliseum, Chicago, Ill., and will open in the Grand Central Palace, New York, N. Y., on May 21. Multifarious uses of wood will be instructively and entertainingly shown. Several national organizations have arranged for holding conventions, the Government will have an elaborate exhibition, and *there will be* plenty of other attractive features for *all concerned* with the uses of wood. Geo. S. Wood *is manager.*

HINTS ON THE MAKING AND USE OF WATERPROOF GLUE

Various waterproof glues and their composition are here severally explained in a concise yet clear style

GLUE can be made insoluble in water by adding tannic acid. Various sorts of glue require different quantities of tannic acid. To make glue insoluble in the hottest water it is only necessary to add to the glue, when in the liquid state, ready for use, a little potassium bichromate and then to expose the glued parts to sunlight. Quantity of potassium bichromate varies but is commonly equal to one-fifth of glue used in work. Important to let the glued parts dry thoroughly before use of them. As glue thus treated cannot be passed into a liquid state any more, it is perhaps better to use the glue at first without mixture, and then, after letting it dry, coat the pieces with bichromate solution, preventing water from entering upon the glue.

Another method to make glue waterproof is to place the glue in water and let it stay there until soft. Take it out before it has lost its original form, i.e., before it runs together to form one mass. Then dissolve in this glue some linseed oil, using a gentle flame or fire, and continue until glue and linseed has consistency of thick gelatine. Such glue is hard and strong, and impervious to water.

Glue, water- and fireproof, can be made by mixing a handful of unslaked lime with 110 grams linseed oil, and then extracting former by dissolving. Then boil mass until it has consistency of thick gelatine. Then spread on sheet of tin. Mass becomes very hard but can be reduced again to

form over a fire, like ordinary glue. This mass is not real glue but a very strong fireproof putty.

A cheap waterproof glue is obtained by melting ordinary glue with the smallest possible quantity of water, and then gradually adding small quantities of linseed oil, which has first been boiled, along with some lead oxide. When the lead oxide and linseed oil mixture are added, glue must be thoroughly stirred.

A similar glue may be made by 100 parts by weight of very thick glue, 50 parts of linseed varnish, and 10 parts lead oxide. Boil mixture for ten minutes and use while hot. The glue has great adhesion and is waterproof.

Similar glue is made by dissolving 1.2 grams of chrome-alum in a little water; then dissolving 57 grams of glue in the usual way by heating, and adding the alum solution in drops, constantly stirring.

In another recipe the glue is soaked for 12 to 15 hours in water, and then water not absorbed is poured off. Remaining glue is heated until syrupy. Then vaseline is added, equal to one-third weight of glue in dry state. This mixture receives necessary stiffness by adding petroleum or similar oil.

Another so-called sulphur glue is made thus: Boil 1 kilogram (2.2 pounds) ordinary glue in 3 liters of water, and let it cool to 104 degrees F. Then 50 grams finely powdered slaked lime and 100 ccm. carbon bisulphide are added to the still warm solution under constant stirring. Mixture is now *ready for use,* but must be kept in air-tight vessel.

To glue wood surfaces exposed to moisture, the *-called curd* cement has given satisfaction. I

is not real glue, of course. It is of curds or white cheese (without salt) and a little lime. Curds are laid on level board and rubbed smooth with wooden spatula, adding only as much lime as needed to give uniform, medium thick, milky pulp. Test by seeing whether resulting cement will form "threads" when spatula is raised. It is then ready for use and is applied to the joints, which should be slightly warmed. It dries slower than ordinary glue. Above details translated from the "Deutsche Drechsler Zeitung."

A LIMIT FOR THE WORD "LUMBER"

Convenience of a word makes it liable to misuse and therefore we receive from our foreign friends a prod or two about restricting its application

SE of the word "lumber" gets once in a while, or oftener, a very broad significance. Our English friends sometimes use the word as meaning any waste material that is especially in the way and therefore an "eyesore." They also go a step further and employ the word "lumbering" to mean an awkwardly heavy gait. But our general use of "lumber" to mean almost anything that has made a start from the forest is likely to prove misleading to them. So we find the "Timber Trades Journal" pointing out the need of greater clearness in this respect in order to give specific definitions. These deficiencies now bother the compilers and students of statistics.

It is shown that in the British customs bill of entry which purports to record the importations, we *have under the word* "lumber" hewn logs, sawn *logs and planks.* Oak planks for wagon buildin

become "lumber;" whitewood logs also are "lumber;" walnut logs are "lumber," and even a large cargo of Cuban mahogany transshipped direct through New York becomes "lumber." Says our contemporary: "We can quite comprehend that when the first settlers on the land had to cut down the trees that were in their way and prevented the work of culture, they should use the good old English word 'lumber' as a term for something undesirable and to be got out of the way, but to use it for all kinds of forest trees in the various forms of manufacture is absurd and misleading."

Perhaps the convenience of the word has led us beyond its safe use. It is not an exact term as commonly employed but it is not likely that the English substitutes will make rapid headway here.

FLYWHEELS APPLIED TO MOTORS ON SAWS

Proposes to give the circular saw a little more go

A CONTRIBUTOR E. E. D. of the "Canada Lumberman and Woodworker" discussed the benefit of applying a flywheel to help out a saw. Further consideration of the plan proposed brought some suggestions by W. F. Schaphorst from which the following abstract is made:

It is practical to place a flywheel directly on a motor shaft instead of running a separate belt from line shaft to an independent flywheel. Prof. Goodman, of England, recommends such motor flywheels *in certain instances*, and such design would be more *economical than* E. E. D.'s arrangement. Best way

to connect such a flywheel to motor shaft would be by a clutch pulley. This would enable operator to start motor with flywheel "off." After motor has attained full speed it can be gradually thrown into action with the flywheel.

Principal thing to be careful of in placing a flywheel on a motor shaft is to see that excessive breaking stress will not be set up in flywheel rim due to centrifugal force. This force is computed from the formula $C = WV^2/gR$ where C is centrifugal force in pounds, W is weight in pounds, V is velocity in feet per second, $g = 32.16$, and R is radius in feet.

This formula shows that great velocity is dangerous, whereas great radius is an advantage. That is the probable reason why E. E. D. used a separate drive for the flywheel. However, rather than a separate drive, I would have placed the flywheel directly on the line shaft, whose speed is doubtless lower than the speed of the motor, i.e., in revolutions per minute.

Of course, I do not want to say that E. E. D.'s arrangement is wrong. He may have had the flywheel on hand and wanted to use it. He therefore made the speed suit the flywheel. But where a new flywheel is used, it is unnecessary to run it through a separate drive.

Energy stored in flywheel is determined from the formula $E = WV^2/2g$ where E is energy in foot-pounds, W is weight in pounds, V is velocity of the flywheel rim in feet per second, and g, as before, equals 32.16. Thirty-three thousand foot-pounds per minute are equal to one horsepower. These formulas enable reader to make the necessar calculations.

THE ENLARGEMENT AND REDUCTION OF DRAWINGS

While the pantagraph is a preferred method of making accurate alterations in the sizes of sketches, yet there is room for other suggestions and here are in brief the elements of a simple plan for the purpose

OUT of several ways of enlarging or reducing size of drawing, there is none very simple. Except by photography, the work depends on number of lines in drawing, and it is often as easy to redraw by measurement as to transfer by more automatic methods. One of the latter —not commonly known—is to change scale by converging or diverging lines. It can be employed with advantage where drawing is not too complicated.

An article in "English Mechanic" gives the illustrations that appear herewith and our text is abridged from same above source. While the method is a simple and interesting one yet the very ready process of the pantagraph should not be overlooked, though as here it is well to be familiar with an alternative scheme when that handy instrument is not within easy reach or a substitute for it can not be quickly contrived.

Original cube in Fig. 1 may be supposed to be any of the three. Lines converging to a center at any convenient distance are drawn from leading points, say, of the largest cube, and these intersect same points in the reduced cubes. If a greater enlargement was wanted, lines would be continued until the required distance apart. Horizontal and vertical lines, of course, are drawn with tee-square and set-square.

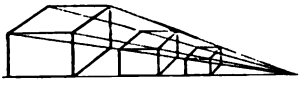


Fig. 1. Cubes Drawn Proportionately by Radial Lines

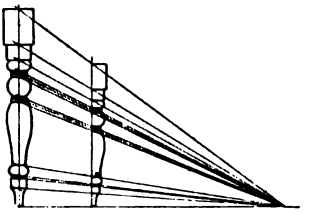


Fig. 2. Proportionate Reduction or Enlargement by a Series of Varying Lengths

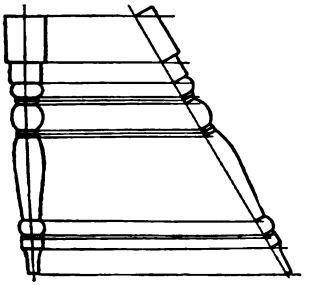


Fig. 3. Another Way of Enlarging or Reducing

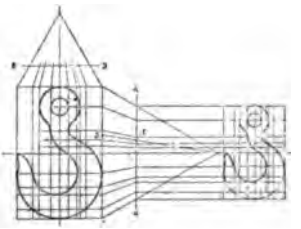


Fig 4. Reduction of a Hook

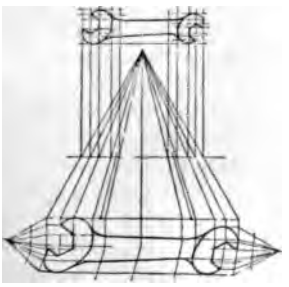


Fig. 5. Reduction of a Wrench

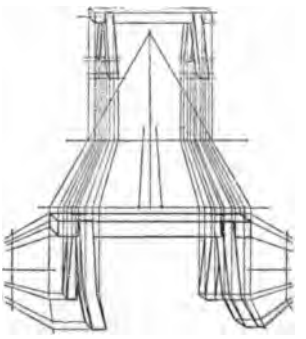


Fig. 6. Reduction of a Trestle

Fig. 2 shows another application of same principle. It would be difficult to increase or reduce so many varying lengths in exact proportion to each other; but it becomes easy with the radiating-line method. Total length can then be fixed precisely, and the intermediate points obtained automatically by intersection of radial lines with a vertical line. A vertical line (not necessarily center line) should be drawn, both on original and copy, to intersect with radial lines. From these points of intersection, lines are then carried along horizontally with a tee-square, and the varying diameters of the profile-lines are determined. In Fig. 2 it would be almost or quite impracticable to obtain them all accurately by same method, because of the many variations within a narrow limit.

Fig. 3 shows a different way, though principle is same. Transferring lines are parallel, not radiating; but the line they intersect is sloping, so that its length and all intersections on it are greater than on vertical line. This enlarges from the vertical original to the sloping copy. To reduce, the original should be sloped and the copy vertical, or parallel sloping lines should be drawn from original to a line at right angles.

As in preceding example, this gives only proportionate lengths, and no corresponding reduction or enlargement in diameter or width. If dimensions are unimportant, and length is chief consideration, as is generally case in such articles as shown, it may be sufficient to obtain lengths and roughly estimate or guess diameters; but in drawings of a different *character the* method would be useless unless em*ployed to* reduce or enlarge in width in same pro*portion as in* length. This is avoided in the cubes.

Fig. 1, because the perspective lines, which connect points on radial lines, give the measurement in second direction. This is not practicable in simple face views or in elaborate perspective.

In most drawings it is essential to reduce or enlarge proportionately in two directions—horizontal and vertical. This can be done by lines converging to centers each way; but a limit is soon reached because number of lines becomes confusing. Therefore, plan is best suited for simple outlines troublesome to reproduce correctly by measurement.

In Fig. 4 is a crane-hook reduced. Hook is first bounded by four lines forming rectangle, and through this two center-lines are carried—one vertical and one horizontal. Equilateral triangles are then drawn, with bases corresponding in length to horizontal and vertical boundaries. Parallel lines are drawn vertically and horizontally across hook through outline where transference-points are necessary. In some cases they cut centers or diameters; in others, two lines at right angles intersect on a curve of outline, and show on reduced drawing a point the curve must pass through. Then, from base of each triangle, all these lines converge to apex.

Reduced size of hook in vertical direction is fixed by position of vertical line A, Fig. 4, and from this a new set of parallel horizontal lines are carried from points where converging lines cut the vertical line A. Next get horizontal line B, bearing a correct proportion in length to A. It would not be correct to draw it at same distance from base or apex *of triangle. Proportion* is obtained by setting *dividers to width of* rectangle enclosing hook, and *transferring this* distance from end to a point

length of rectangle. In Fig. 4 it is transferred from bottom right corner at C to point D. Width and length are indicated on the line A by drawing converging line from D to the apex of triangle, which gives point E on line A. Width thus obtained gives length of horizontal line B.

A rectangle of new length and width is drawn, and divisions on it are made by carrying horizontal lines along line A and transferring others from B. As latter cannot be projected to reduced view, they must be transferred with dividers; or a better way is to place edge of a strip of paper against the line B and tick off divisions on it; then shift paper to reduced view, and tick them off on that. We now have a small rectangle with horizontal and vertical lines across it corresponding in proportion with big one around large hook, and this is a guide for drawing small hook correctly to scale.

As wrench in Fig. 5 is greater in length than width, it is convenient to have separate set of radial lines at each end, instead of carrying all to a single center at one end. It simply means transference to each end of reduced view, and lines relating to each end are thus kept where they are wanted, and cannot be confused with others. A boundary line is drawn around wrench, same as around hook in Fig. 4; also, that triangle at smaller end does not necessarily have to correspond in length of base with other; but can be reduced as seen, including only width of wrench at that end. It makes no difference whether it is just the width as shown, or wider on one or both sides, as long as *center-line* to its apex equally divides the base. *Widths of* bases are transferred to horizontal line *above to two* points indicated by a black dot, an

rom there converge to cut reduced horizontal ength, and give widths proportionate to that length.

Trestle or horse in Fig. 6 is treated like wrench, each end taken separately. Ends are practically alike, and it is sufficient to take reduction from one only. If perspective made an appreciable difference in height of each end, or if they differed in shape or size, treatment of each end as shown would be essential. Convergence in large triangle begins on a horizontal line above top of trestle. This line is separated from trestle line merely for clearness. It makes no difference where this line is, as long as those which intersect it come parallel, and start their convergence or divergence from it.

In two previous examples a clear line full length is drawn, touching the object at one point, and incidentally forms a line of transference in other direction. A reduced or enlarged view can be made above or below or to either side of original, according to convenience. It can be made on a separate sheet of paper by transference of divisions, instead of projecting with tee-square. This is easily done by ticking them off on edge of a strip of paper and transferring to where they are wanted, as has to be done, in any case, in one direction, even when the other is projected.

Avoid friction. Lubrication applies for the same reasons to minds as well as to machines.

Management is planning the work as well as *working the plan.*

DISEASES DUE TO SAWDUST IN SHOPS

Sundry woods that have caused trouble to machine woodworkers and some simple means for preventing diseases of this more or less serious character

INDUSTRIAL diseases due to sawdust and the dust always found in woodworking shops were first studied fourteen years ago. In 1898 an English doctor noticed that a number of workmen employed in the same shop suffered with skin disease attacking face, neck and hands. It resembled erysipelas, grew better when men stopped work and reappeared when work was resumed. All had worked on same kind of wood, namely East Indian satinwood.

Another physician found that men working with the so-called Indian giantwood suffered from itching sensations similar to nettle-rash. Another reported that workmen employed in shipbuilding plant to finish interior decorations in satinwood suffered skin diseases in the shape of red itching spots, which later became wet and then peeled off. Disease appeared again whenever satinwood was again machined, though mahogany and oak had been worked between times.

Recently two new cases were recorded where workmen had machined Atlas wood. Arm showed light red itching spots, and back of hand was light red and swollen. In the other case the arms and even the fingers were covered with red itching spots. In third case the face was also affected, being red, the eyelids swollen, the back of both hands swollen, and hands and arms covered with red blisters. In latter case satinwood was responsible.

Reports as to danger of various woods vary greatly. It seems as if East Indian satinwood is more dangerous than West Indian. Ebony, rosewood, West Indian boxwood tree, partridge wood, teak, and several mahogany and cedar kinds have been harmful. Dangerous element seems to be some alkaloid in wood which dissolved in alcohol and rubbed on arm caused inflammation. Satinwood contains a viscous yellowish-brown oil.

In some cases where men had suffered from working with satinwood, a touch of the wood or of tools used for working it was enough to cause irritation. Last analysis seems to be unable to explain origin of the trouble. Claim that men had very sensitive skins was offset because these men had worked for years with turpentine and varnishes without trouble. Investigation seems to point to a combination of wood having great density, hardness and capable of a high polish causes trouble to only certain kinds of persons. Heavy perspiring is very favorable toward inflammation.

In a Breslau wagon works trouble was experienced with men working with teakwood, until management introduced a suction system which removed all dust. Ordinary sawdust may cause trouble, as was proved in a piano factory where men complained of inflammation of the eyes and running eyes due to the very fine dust. Another physician found that some joiners were subject to inflammation of the conjunctiva with inflammation of the eyelids, due partly to fine sawdust and partly to fumes of denatured alcohol used in work. Skin eruptions have been blamed upon the pyridine in *polishes.*

A most fertile field for industrial diseases in wood-

working plants is the shop making no arrangements for removing the extremely fine sawdust. The Munich department of health reported 154 cases, more than half of them among woodworkers. Fine sawdust, being extremely fine and light, is breathed into the lungs. This dust under the microscope shows fine wood particles, sharp points, pointed wood cells, or cells broken, crushed, sometimes provided with fine hooks. Dust of hardwood like beech, maple, mahogany, etc., is finer and in greater quantities than softwood.

Of 1000 records from trades developing dust, 2.39 per cent died in shops having dust prevention means, and 5.96 per cent in those without these means. According to reports from Vienna from the Woodworkers' Guild, 74 per cent of the deceased woodworkers died of tuberculosis, and Sommerfeld places this figure at 6.75 per 1000.

The Vienna Joiners' Guild is making strenuous efforts to have dust removal equipment installed in all shops, and is trying to forbid use of smaller shops as sleeping places for apprentices and journeymen, which is very common in Europe where the old apprentice system in which the apprentice remains in the master workman's home for a period of years is still much in vogue. In Baden the courts ordered the management of a cigarbox plant to provide all saws and planers with suction dust removers. Above comments are from the "Deutsche Drechsler Zeitung" which also says that those plants using exhausters have less trouble with sick *employees* and that the accidental stopping of these *exhausters* brings complaints of throat or lung *irritations.*

THE FIREPROOFING OF WOOD

Wood will resist fire in a marked degree when compared with many other materials, and means for further improving its fire-resistant qualities are given

FIREPROOFING of wood was known even to the ancient Romans who tried to make their wooden towers and defenses less inflammable by coating them with vinegar or alum solutions. Covering wood with a fireproof coating serves only to surround it with an insulating coat, making it difficult for fire to reach the wood and to prevent the approach of oxygen to the wood, which is necessary for combustion.

Most important requirements of fireproofing solutions are durability and power of expansion. Wood expands and contracts with changing temperature and the fireproofing solution must keep step with the wood or else lose its protective powers. Wood is hygroscopic and coating must not peel off through moisture. Another requirement is sufficient porosity, as there must be constant balance between air and wood, otherwise the wood will decay.

In the vacuum process the wood is placed into airproof chambers from which the air is exhausted. Then an impregnation liquid, usually a mixture of ammonium sulphate and ammonium borate, is pumped into boilers. Pores of wood being in a vacuum and void of air absorb the mixture, and the wood is then dried in open air. Wood impregnated in this way is fireproofed down to core, and is fireproof even after ten years as tests have shown. It suffers a trifle in its elasticity through process bu

compressive strength is increased materially. Wood does not change its structure or color either, thus keeping it useful for interior decorating. German building authorities of several cities have adopted wood made fireproof in this manner for inside finishing, and have demanded its use for temporary structures filled with inflammable materials. Cost of impregnating wood, further states "Die Holzwelt," runs from $2.50 to $4.00 per 35 cubic feet in Germany.

SAFETY REGULATIONS FOR STORED LUMBER

Certain rules for the safe storage of lumber, from which we can gather a wrinkle or two of worth

SEVERAL disastrous fires have caused the authorities in various German cities to make more stringent the safety regulations for lumber storage. Most important of these fire prevention rules are taken in abstract from "Die Holzwelt."

If quantity of lumber stored exceeds 17,500 cubic feet, and the area covered by the lumber is over 1,000 square feet, special permits must be obtained from police and fire departments. Lumberyards must have an 8-foot high solid wall or fence and if near to houses the wall must be brick and at least 12 feet high. Lumber must not be within 3.3 feet of wall. Buildings in yard or near it must be protected from lumber by a high masonry wall. If the buildings are not protected by walls, lumber must be 20 feet from buildings. Every lumberyard not opening directly upon a street must be connected with it by

ISSTON STEEL *and* DISSTON SAWS

THE foundation of the efficient and durable saw is the steel from which it is made.

Expert workmanship carrying out proven designs as to shape of teeth, etc., cannot build a lasting, smooth cutting saw without the foundation of a suitable steel to work upon.

It is chiefly to the extraordinary success of the Disston Plant in producing a superior steel for the purpose that may be attributed the rapid growth and steady demand for Disston Band and Circular Saws.

When the Disston Steel Works were established in 1855, a new era in saw making began. It was not only the first plant of its kind in America, but the first anywhere in the world to produce a perfect saw steel—a steel possessing the peculiar qualities necessary to the manufacturing of a perfect saw. The Disston Steel Works are in charge of an expert who thoroughly understands the requirements of a perfect saw steel and the making of Disston Steel to meet those requirements. Under his supervision are other experts who have, through constant invention and experiment, continued to improve this famous steel.

Disston Steel can never be duplicated, and that is one of the principal reasons why Disston Saws will retain their superiority for all time.

HENRY DISSTON & SONS

Incorporated

Keystone Saw, Tool, Steel and File Works

PHILADELPHIA, U. S. A.

Chicago, Boston, Cincinnati, New Orleans, Memphis, San *Francisco,* Seattle, Portland, Spokane, Sydney, Aus., *Vancouver.* *Canadian Works,* Toronto, Can.

driveway 10 feet wide. Lumber stored in open air without fireproof covering may be stacked to height of 20 feet.

Yard is to be divided into squares of at most 5,000 square feet area, and these squares must be separated by 10-foot wide paths. Outside business hours these paths must be clear of obstructions so that apparatus may not be hindered in getting to all stacks in case of fire. In special cases, where position is isolated, the fire department may require construction of special water tanks and other safety equipment.

Storing lumber in quantities of more than 3,500 cubic feet is allowed in buildings devoted exclusively to lumber storage on all floors; in buildings used for other purposes, only in cellar or underneath roof. In latter case, storage rooms for lumber must not be in direct communication with stairways, and must have exits leading directly into open air. They must be surrounded by solid masonry fire walls. In buildings where these storage rooms have exits to stairways, only 1,750 cubic feet of lumber may be stored, and then only if the lumber room is inclosed fireproof with brick fire-curtain walls, and separated from stairways by iron doors. No lumber may be nearer than 100 feet of railroad tracks.

Chips cut from beech find use in breweries for clarifying and filtering beer and are known as "brewer's shavings."

Claim is made that in Germany 94 to 96 per cent of the whole tree is utilized while we use about 40 per cent.

ONLY a few fancy touches are necessary to bring perfect final finish — after a flat hardwood surface, solid or veneered, has been passed through

A Whitney
Wood Scraping Machine

So rapid is its action that it far outstrips any other means or method of producing a final finish—yet every hardwood surface scraped by a Whitney is up to the same standard of excellence, whether it be curly, cross-grained or quartered stock.

The Whitney Wood Scraping Machine leaves the pores of the wood open and free from dust and grit—the grain shows clear and sharp.

Say the word by postal or letter and we will send you samples of hardwood, solid or veneered, that have been finished on a Whitney Scraper, or we will scrape some of your own samples. They will convince you as to smoothness. We will do the same as to the lower cost of finishing.

BAXTER D. WHITNEY & SON

WINCHENDON, MASS.

California Office, Berkeley, California
North Pacific Coast Office, Stetson-Ross Mach. Wks., Seattle, Wash.

Selling Representatives

Chicago Machinery Exchange, 1219-27 Washington Blvd., Chicago, Ill.
Wysong & Miles Co., Greensboro, N. C., Agents for Virginia, North and South Carolina, Georgia, Florida and Eastern Tennessee

THE CEMENTING OF BRASS ORNAMENTS ONTO WOOD

A method of getting a sure grip onto metal by glue

NQUIRY as to the means to be employed in the cementing of brass ornaments onto wood brought from a correspondent of "Work" this answer:

The inlaying of brass to wood, where a screw is not permissible, is a troublesome task, as it is seldom firmly affixed with ordinary glue. By the following means, however, such metal can be permanently glued to the wood without any fear of it falling out when the glue dries.

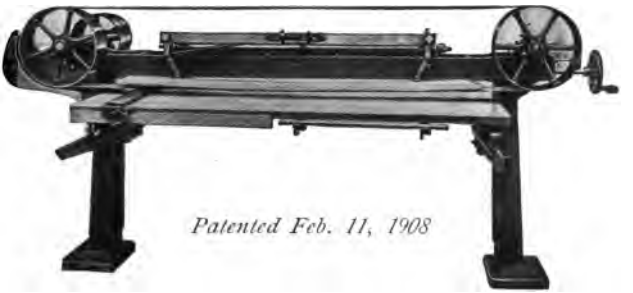
Make some glue in the ordinary way, but of double the usual consistency, and to every pound of it put in 1 fluid ounce of glycerine and 1 ounce of slaked lime, and allow the glue to boil. Stir it well so as to entirely mix the glycerine and lime.

Previous to spreading the glue, dip the brass in a weak solution of nitric acid (1 part acid to 10 parts water), which will very slightly roughen the surface of the metal, and afford a better grip for the glue.

Warm the metal, and spread the glue on both the metal and the wood, press the inlay well in the wood, and when the glue dries it will be perfectly cemented in. The addition of the glycerine prevents the glue from shrinking when dry.

A daily newspaper having an average circulation of 60,000 copies and an average edition of 20 pages uses every day the product of about four acres of spruce forest, according to Forest Service figures.

Our Twentieth Century
BELT SANDER



PERFECTION IN ITSELF

Will do double the amount of work of a hand block machine and do it better and easier.

Complete Control ***Only One Lever***

enables the operator to sand his work at any point, as much or as little as he pleases, without changing his position.

OUR SPECIALTY IS

RUBBING AND POLISHING MACHINES
BELT SANDERS
DOUBLE MITRE SAWS

Write for circulars to

Maddox Machine Company

Jamestown, N. Y.

COMMERCIAL WORTH OF OAK FLOORS

Differences of oaks and shop methods of manufacture

ONE of the first things which an individual instinctively notices on entering a residence or building is the flooring, says the "American Lumberman." This is especially true if that individual contemplates purchasing the building. The prospective buyer is quick to note oak floors, as they give a touch of character and quality.

Any building with oak floors is distinctive and individual and possesses the extra commercial worth and salability that belongs to distinctive things. Real estate men in their advertisements, almost without exception, make a point of mentioning oak floors if the building to be sold has them. This one thing has proven a big factor in making sales.

Even in the unfurnished house oak floors create an atmosphere which is friendly, and this material is considered by architects as second to none of the various floorings used.

Machinery used in the oak flooring factories of today is different from that used ten years ago. Oak flooring is milled today with an exactness, under expert inspectors, which requires but very little scraping by those laying floors. All of the manufacturing process is given close inspection and floors are frequently made up for testing purposes.

After being milled, this flooring is separated into the different grades and tied in bundles. Temperature of the warehouses is carefully regulated to keep the stock in normal condition and on leaving the fac-

Increase Your Profits

BY USING

OBER LATHES

SANDERS, RIP SAWS, BOLTING SAWS, SHAPERS, ETC.

∴ *We make lathes for turning* ∴

AXE, PICK, SLEDGE, HAMMER and HATCHET HANDLES, SPINDLES, BALL BATS, TABLE LEGS, NECK YOKES, WHIFFLETREES, ETC.

WRITE FOR CATALOGUE No. 23

THE OBER MFG. CO.

CHAGRIN FALLS, O., U. S. A.

Please mention this paper

tory it is as near perfection as is possible to make it. Many dealers, through ignorance or carelessness, handle oak flooring as they would lumber and store it in damp places. A good plan is to keep the oak flooring in a warm cellar or a dry room in the house in which it is to be laid for at least a week or ten days. Oak floors are often badly damaged by improper laying and scraping.

Foresters and manufacturers of oak lumber divide all oaks, of which there are about sixty species, into two distinctive groups—the white oaks, and the red oaks. Red oak requires two years to mature its acorns, and the white oak takes one year. Woods of the two types are structurally different. In physical structure the white oak is of a much denser texture than the red. White oak is preferred for flooring purposes, as it receives and holds a higher polish and is considered more durable and satisfactory.

Lumbermen usually determine colors from bark of tree rather than from color of wood. There also is a difference in the leaves; the lobes of the black oak leaves usually having a sharp point, while the lobes of the white oak leaves are rounded.

Some species of red oak have a heartwood of a decidedly red color. Oftentimes in red oak there are seen pieces that might be mistaken for white oak, which fact has led to contention among buyers and manufacturers. Red oak grows faster than the white, thereby making it coarser in texture. In the quartered white oak a decidedly better figure is found than in the red. Most timbermen know the oaks by sight, but it takes an experienced yardman to pick them out of a pile.

TO get the maximum capacity from your Continuous Feed Jointer, you should fit it with the Genuine Morris Wood & Sons 20th Century Solid Steel Guaranteed Glue Joint Cutters.

These cutters will be furnished on your new Jointer if you insist upon it. *Our Guarantee:* Better cutters have never been produced. Our thirty-eight years of cutter-making reputation back this guarantee. Can you beat it? Better get a line on our prices.

Write now for Circular W. C.
It tells all about them.

MORRIS WOOD & SONS

5108-5110 W. Lake St. CHICAGO, ILL.

FACTORY MACHINES IN THE WOOD-WORKING OF RED CEDAR INTO PENCILS

Eberhard Faber started a successful plant for making lead pencils in 1861 at New York. A pencil slat is 7¼ by 2½ by ¼ inch. These are cut in Southern States and shipped bundled or crated, a crate containing enough stock for 100 gross of pencils. Slat has six grooves cut in it by machine, lead strips are laid in grooves and glue coated, then covered by another slat. A machine now separates the whole into rough pencils which are polished, painted, stamped and graded. Syracuse University figures show 315 million pencils made annually, red cedar being preferred material.

Yellow poplar or tulip-tree, the largest broadleaf tree in America, has been known to grow to nearly 200 feet high and 10 feet in diameter.

The Smith-Booth-Usher Co., machinery and supplies, Los Angeles, Cal., has been reorganized with the following officers: H. P. Usher, president and managing director; J. R. Hoffman, vice-president; E. P. Duncklee, treasurer; J. A. Nickell, secretary; L. M. Shockley, assistant secretary, and E. H. Breidenback, general manager of sales.

An athletic association has been organized at the Henry Disston & Sons' works and the Tacony Ball Park is to have elaborate improvements for this purpose. In addition to baseball, other sports will be encouraged, such as football, basketball, running, jumping, etc. All employees of the firm, both male and female, will be eligible for membership. A junior branch will also be organized for boys.

Sanding Chair Legs — Carborundum Brand Garnet Belt

The 100% Sanding Equipment

Good sanding machines properly cared for — good operators backed up by the best Garnet Paper and Cloth you can get and you will come mighty near to having the ideal sanding conditions.

Carborundum Brand Garnet Paper and Cloth

Cut clean and quick — they are coated with Hard, Sharp, Clean Garnet that has the life.

They Cut the Cost of Sanding

Every inch of paper and cloth, every bit of glue used in their manufacture, is of the highest possible quality.

Send for sample sheets.

THE CARBORUNDUM COMPANY

NIAGARA FALLS, N. Y.

New York Chicago Boston Philadelphia Cleveland Cincinnati Grand Rapids Milwaukee

The Phillips "No-Kick" Saw Guard

Ask the workman who has worked on a table equipped with the Phillips "No-Kick" Saw Guard how he likes its protection. He will tell you that he can do faster work and that he is able to give his entire attention to the handling and feeding of the stock with absolute assurance of freedom from injury either from the knife or from pieces of wood flying back.

In addition to the saving of personal injury, this Guard enables your workmen to more freely and quickly handle their work. Order one of these Guards, attach it and try it to your own satisfaction.

The Phillips Manufacturing Co.
Orlando, Florida

WHAT IS THIS?

A Systematizer of the glueroom, some call it. Others say it is a **Common Sense Drier** for Crossbanding and Veneer.

IT IS BOTH!

If we give it away? No, not quite, but we sell it to reputable manufacturers on a blanket guarantee to turn out flat and bone dry crossbanding and veneer quicker and better than is possible in any other way.

Of course, you can get along without. You have done so, your father and your grandfather, perhaps, but maybe it would pay for itself in 15 to 18 months and do away with all your troubles, if you have any in your glueroom.

Tear this out and mail it to

"MERIT," - Lockport, N. Y.

Do You Make A Fair Profit?

THE AVERAGE LIFE of a manufacturing concern is fifteen years. Nearly 5000 went under last year. None of them knew their factory costs. 97% of all manufacturers do not know accurate costs. That's one of the big reasons why so many fail.

Do You Know Your Costs?

A DENHAM COST SYSTEM will give you absolute costs without expense or red tape. It is not a cut-and-dried system of forms but a service by expert investigating engineers who analyze factory conditions and build a system for each individual plant.

That's why Denham Cost Service has placed systems in 500 factories in over 80 cities. Denham customers say the system is indispensable in their business and pays dividends several times each year.

May we tell you how to make more profit in the furniture business?

¶ *"Science of Costfinding" sent free upon request.*

The Denham Costfinding Co.
Illuminating Bldg.
Cleveland

FISCHER'S PATENT No. 9 AUTOMATIC SELF-FEED CUT-OFF SAW OR SLASHER

Is a foot control Cut-Off Saw particularly adapted for fast and accurate work on Doors, Sashes, Blinds, Boxes, Furniture, Car Material, etc.

Both hands of the operator are left entirely free to inspect and quickly handle the stock.

Cuts stock from 2 to 22 inches wide any angle up to 45°.

Its tightening devices are so arranged that the belts cannot slip even under the heaviest load.

Write us today for information on its many other new and valuable features, mentioning "Wood Craft"

Fischer Machine Works

1841-45 Carroll Ave. **CHICAGO, ILL.**

Palmer's Gluing Clamps

The one thing you want to avoid is time-consuming devices.

What you have to do, you want done right and done quickly.

No other gluing clamps made are as practical, quick and sure in their work as PALMER'S CLAMPS.

They are simple and easy to operate and will clamp long stock, short stock and change from one width to another.

Write to us now and we will show you to your satisfaction that with Palmer's Clamps you can clamp glued stock in the minimum of time, with the minimum of effort and expense, and that with them you get service, speed and adaptability that no other gluing clamp can give.

Ask for full details and prices now.

A. E. PALMER & SON

OWOSSO, MICH.

The Projectile Co., London, Eng.
Schuchardt & Schutte, Berlin, Germany

On What Basis do You Buy Planer Knives?

If it is quality, you will be interested in knowing that the **"Coes" Planer Knives** rank A-1 in this respect.

Our meaning of quality is just this:—

The best material obtainable—uniformity of dimensions — uniformity of temper — special process—ground to a micrometer gauge—uniformity of finish.

Snug Fitting, Fast Cutting, Long Wearing

Every New "Coes" customer means a new "Coes" advocate —a new "Coes" advertiser.

A trial order will decide your source of Planer Knives Supply.

Remember the Name— Remember the Mark

We are independent manufacturers, members of no association, no trust, and we make the best knives.

Loring Coes & Co.

Incorporated

Box C, Station B **WORCESTER, MASS.**

WARNING!

Poor imitations of our Guide are on the market. A possibility of claim suits by sending us your orde

PATENTED
Aug. 12, 1890
Feb. 10, 1891
Mar. 28, 1891
April 12, 1891
April 25, 1893

New Patent Issued March 4, 1913

We are in a position to furnish you these guides at the same price you can buy the imitation, ***and further, furnish you a guide which we can guarantee.***

Send us your orders direct for ***Guide Repairs.*** Duplicate parts always carried in stock.

The Charles E. Wright C

Sole Manufacturers **Kenilwor**

(Mention Wood Craft in writing)

Holmes No. 46
ariable Feed Planer

IF you are not already operating such a planer, it will pay you to investigate the HOLMES No. 46.

Its feature of variable feeding enables you to handle practically every kind of stock to its best cutting advantage.

The HOLMES No. 46 will handle stock as wide as 24 inches and as thick as 8 inches, covering practically every requirement of the average shop.

Prices and complete description of the HOLMES No. 46 VARIABLE FEED PLANER will be given by writing

t B. HOLMES MACHINERY CO.

Chicago St. **BUFFALO, N. Y.**

FOR 30 DAYS

YOU MAY TRY A

Kelley Electric Router

IN YOUR SHOP ABSOLUTELY ***FREE***

Tear out this offer and mail it at once and state whether you are interested particularly in

Stair Work or
Cabinet Work
General Mill Work

Column Fluting
Inlay Work or
Architectural Woodwork

Kelley Electric Machine Co.

1407-1409-1411 West Ave.
BUFFALO, N. Y.

R. L. SCRUTTEN & CO., Ltd.
161 Clarence St., Sydney,
Agents for Australia

HENRY KELLEY & CO.
26 Pall Mall, Manchester, E.C.,
Agents for Great Britain

The COLBURN Universal Saw Table

is a machine in which the distinguishing features are

SPEED
CONVENIENCE
ACCURACY

Our complete catalog is yours for the asking — drop us a line

Colburn Machine Tool Co.

Franklin, Pa.

Are You SAWING Lumber

When You Could Use A

BENDING MACHINE?

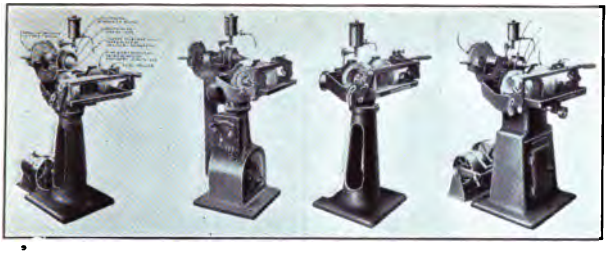
SAVE STOCK AND LABOR AND HAVE NO CROSS GRAINS IN STOCK

Write us for prices and cuts of our Hydraulic Steam Benders

Benders exhibited at Chicago Machinery Exchange, Chicago, Ill.

L. G. McKnight & Son Co.

Gardner, Mass.



Mummert-Dixon Oilstone GRINDERS

are without a rival for effective abrading and putting a keen edge on tools.

During the years that we have been making MUMMERT-DIXON GRINDERS, not one has ever been returned because of any failure to do all the work that was expected of it.

We make MUMMERT-DIXON GRINDERS for practically every purpose including, grinding cone, leather wheel, emery wheel, motor drive, coarse and fine oilstone wheels, automatic knife sharpener, tool holder, etc.

Send for our new catalog which describes in detail the various grinders which we make, and the variety of shop conditions for which they are especially designed.

Mummert-Dixon Company

Hanover, Pa.

Oliver Machine Co., Manchester, Eng.
Sole Agents for Great Britain

NOTICE

We would like to have all the progressive

Superintendents and Foremen

of all classes of woodworking plants receive

WOOD CRAFT

IN order to have it mailed to you free it will be necessary for you to fill out the blanks below and mail to

Wood Craft

Caxton Bldg. - - - Cleveland, O.

Name .....

Street Address.....

City and State.....

Position I hold.....

Name of firm where I work .....

Fare $3.00

——DAILY BETWEEN——

Cleveland and Buffalo

THE GREAT SHIP "SEEANDBEE"

Length 500 feet; breadth 98 feet, 6 inches: 510 staterooms and parlors accommodating 1500 passengers. Greater in cost—larger in all proportions—richer in all appointments—than any steamer on inland waters of the world. In service June 15th.

Magnificent Steamers "SEEANDBEE," "City of Erie" and "City of Buffalo"

Daily—CLEVELAND and BUFFALO—May 1st to Dec. 1st

Leave Cleveland -	8:00 P. M.	Leave Buffalo -	8:00 P. M.
Arrive Buffalo - -	6:30 A. M.	Arrive Cleveland	6:30 A. M.

(Central Standard Time)

Connections at Buffalo for Niagara Falls and all Eastern and Canadian Points. Railroad tickets reading between Cleveland and Buffalo are good for transportation on our steamers. Ask your ticket agent for tickets via C. & B. Line. Write us for handsome illustrated booklet free.

THE CLEVELAND & BUFFALO TRANSIT CO., Cleveland, O.

Your Collection of Books is not complete unless you have a copy of

The Art and Craft of Cabinetmaking

By D. DENNING

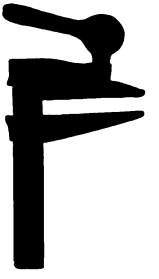
IT gives chapters on the distinction between cabinetmaking and joinery, the development of furniture, furniture woods, glue, nails, screws, etc. Tools, tool sharpening, use of tools, joints, decorative and minor structural details, construction, glass in furniture, drawing and designing, veneering, cabinet brass-work, table construction, bedroom furniture, library and other furniture, sideboards and cabinets.

320 pages–219 illustrations–cloth, for $1.50 postpaid

FOR SALE BY

WOOD CRAFT Cleveland, O.

THE UNIVERSAL CLAMP



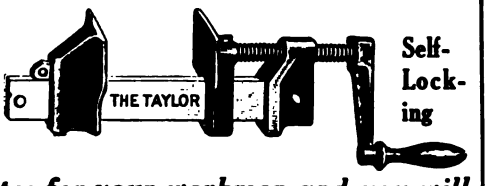
is a Time Saving, Quick Acting Clamp, especially adapted to Veneering, Paneling, and all kinds of work requiring long, broad jaw.

ASK FOR CATALOGUE No. 252

BATAVIA CLAMP CO.

165 Center Street, Batavia, N. Y., U. S. A.

Quick-Acting



Self-Locking

Save minutes for your workmen and you will save money for yourself.

A man's time costs just so much per hour; use clamps that will increase his output.

Moreover, TAYLOR CLAMPS cut down the amount actually expended for tools.

A recent visit to the Brooklyn Navy Yard showed that TAYLOR CLAMPS purchased ten years ago were still working, while clamps of the next best make on the market used under the same conditions had worn out in five years.

Catalogue No. 11 shows 22 styles. **Free on request.**

James L. Taylor Mfg. Co. Poughkeepsie, N. Y.

A GOOD BENCH
is like a sharp tool. Both make work easier and produce it faster.

CHRISTIANSEN BENCHES
are built so substantially that once you buy them you will never hesitate when the time comes to reorder.

Tell your Hardware Dealer you want the Christiansen Bench

C. CHRISTIANSEN, 2225 Grand Ave., Chicago, Ill.

BENCHES - TOOL CHESTS - HAND SCREWS

Loose Pulleys That Earn Money

Sent on trial at our risk.

Wilmarth & Morman
(Nelson Patent)

Your first investment is your last investment when you buy from us.

Actual experience of over 12 years has demonstrated that they will run without being touched, except occasionally for oiling.

Stop trying to repair your old pulleys and put in the kind that never need repair.

Wilmarth & Morman Co. 1182 Monroe Ave., N. W. Grand Rapids, Mich.

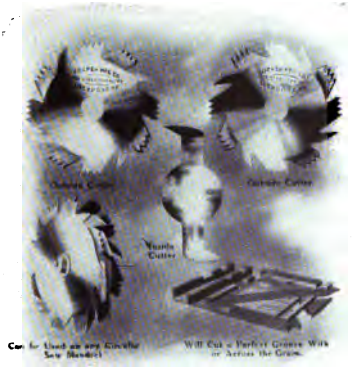
THE EMPIRE DOUBLE DRUM SANDER

will give you a machine of maximum strength and durability, combined with perfect work.

Write us for the names of firms using this sander and you will find that they are not only well pleased, but that their investment in the Empire is less than that of other sanders.

W. A. HEATH MACHINE CO.

368 BALDWIN ST. **LESTERSHIRE, N. Y.**



The Best Groover or Dado Heads in America are

COCKER'S

Sizes ⅛" to 2" or more in width.

YOU will also find the Cocker Shingle, heading, concave, resaws and chisel-tooth saws to be the best on the market. We make knives of every description. They are fully guaranteed.

Write us for prices and complete description

THE COCKER MFG. COMPANY

85 Market Street : **Lockport, N. Y.**

$1.00 SECURES FOR YOU A PAIR OF
Walker's Improved Steel Bench Cams

They are as good as a vise and better for many kinds of work. Absolutely indispensable in piano factories, for holding down frets and thin panels.

Walker Cams do not split the stock, and they save nailing it down.

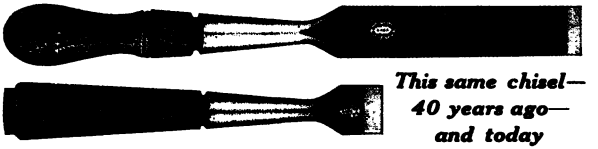
Order a pair from your dealer and find out what a time-saver they really are, or if you cannot secure them locally, write direct to us.

A. V. WALKER
707 Main Street : : : Leominster, Mass.

Do you want any Technical Book on Woodworking Subjects?

We have a catalog which covers this line and will be glad to send you a copy
Free

Address
WOOD CRAFT
Cleveland, Ohio



This same chisel—
40 years ago—
and today

It Took 40 Years to Wear Down This Chisel

and it is giving as satisfactory service today as when first bought.

BARTON EDGE TOOLS

are made even better today than they were 40 years ago.

Specify them. If your hardware dealer should be unable to supply you, send to us for a catalog and our free Story Book entitled "True Stories." It is worth your reading.

MACK & COMPANY

Brown's Race near Platt St. ***ROCHESTER, N. Y.***

CAR BUNKS

OF

"ANDREWS" MAKE

Are different
Are smooth running
Are better constructed
Are cheaper in the long run
—Than Any Other Make

SUPPLIED IN ALL SIZES BY

The A. H. Andrews Co.

115-117 S. Wabash Ave.
CHICAGO

SILVER'S NEW JOINTERS

Built for accurate work as well as hard service. Round safety cylinder can be supplied at slight additional cost.

We also make a complete line of ***Band Saws, Saw Tables and Swing Saws.*** Send for our New Catalog No. 60, which describes in detail our entire line.

The Silver Manufacturing Co.

345 Broadway - - SALEM, OHIO

THE

WEATHERLY

INDIVIDUAL

Glue Heater

Send your address and receive descriptive circular of Glue Heaters, Glue Cookers and Hot Boxes with prices.

The Weatherly Co.

Grand Rapids, - Mich.

Extensively used by the Grand Rapids furniture workers.

A Careful Reading of Our Free Catalog on the

CRESCENT UNIVERSAL WOODWORKER

will show you just how practical every part of this machine is made.

Its Band Saw, Jointer, Shaper, Saw Table and Borer are built entirely separate, enabling one to five men to work upon the Universal at any one time.

Cut down your investment. Save space and needless steps by using this machine. The less investment you have in machinery, the more money you will have for materials and a larger payroll. Investigate the Crescent Universal Woodworker by asking today for a copy of our **FREE** Booklet.

THE CRESCENT MACHINE CO. **22 COLUMBIA ST. LEETONIA, OHIO**

This is Something You Want!

IT will prevent you from making financial losses, also assist you in securing new customers.

THE RED BOOK

is published semi-annually in February and August.

It contains a carefully prepared list of the buyers of lumber in car lots, both among the dealers and manufacturers.

The book indicates their financial standing and manner of meeting obligations. Covers the UNITED STATES, ALBERTA, MANITOBA and SASKATCHEWAN.

The trade recognizes this book as the authority on the lines it covers.

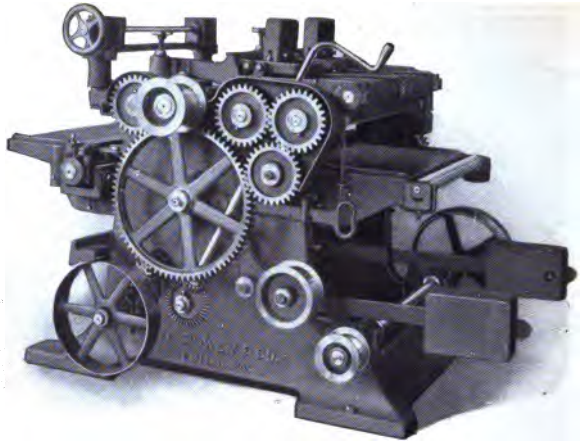
A well organized Collection Department is also operated and the same is open to you.

Write for Terms.

Lumbermen's Credit Association

ESTABLISHED 1876

608 So. Dearborn St. CHICAGO — MENTION THIS PAPER — **116 Nassau St. NEW YORK CITY**



POWER'S No. 14 DOUBLE SURFACER

is a machine which will give you exceptionally smooth work.

It is one of our latest designs, and built along the newest lines for quick, accurate and constant surfacing.

We will send you upon request one of our complete descriptive folders, showing this **No. 14 Surfacer.** It is built either with solid or divided rolls, for single or double surfacing.

SEND FOR THIS NEW FOLDER TODAY

Wm. H. Field Co.
Boston, Mass.

Olney & Warrin
New York

L. Power & Co.

6 South 23rd Street
Philadelphia, Pa.

Eby Machinery Co.
San Francisco, Cal.

Zimmerman-Wells-Brown Co.
Portland, Oregon

We make Band Saw Blades of Imported Steel
They Last Longer

Gardner Service

If you might follow the journey of a printing order as it enters and passes through our plant, from its beginning to completion, you would discover many facts of interest.

Quantity production successfully carried on necessitates a thorough organization. So it is with Gardner Printing.

On not a small proportion of the work we handle we are able, through our Service Department, to aid in its more effective use and distribution, through furnishing to our clients in reality the job complete—copy, layout, art illustration, selection of paper, and suggestions for color treatment.

In the production of your printing, not only do we employ the most experienced workmen for Type Composition, Proofing, Make Ready and the Running of your order, but each department is under the constant superintendence of its manager, a man in each case whose experience covers years of service in the handling of thousands of dollars annually of Gardner Quality Printing.

In addition to the perfection of our manufacturing system, we offer you in connection with your business the experience of a Managerial and Editorial Board, specialized in the class of trade you wish to reach.

The experience of this Board, placed at your disposal, while almost outweighing every other consideration, adds uniquely to our facilities.

Gardner Printing knows no geographical limitation. Whatever your location, your printing will receive thorough and profit-producing service when sent to

THE GARDNER PRINTING COMPANY

Cleveland

The Expert Wood Finisher

A Complete Manual of the Art and Practice of Finishing Woods by Staining, Filling, Varnishing, Waxing, Etc.

By A. ASHMUN KELLY

339 Pages *6 x 5½ inches*

CONTENTS

Description of Woods Used in Wood Finishing.
Fillers for Filling Woods.
Finishing the Woods.
Filling and Fuming Oak.
Piano Finishing.
Finishing Veneer Work.
French Polishing.
Stains and Staining.
Various Stains for Various Woods.
Formulas for Staining Woods.
Shellac Varnish.
Flatting Varnish.
Examination and Testing of Varnish.
Varnish Troubles Explained.
Varnish and Varnishing.
Finishing Hardwood Floors.
Furniture Finishing.
Doing Up Old Furniture.
How to Treat Stains, White Spots, Etc., on Furniture.
General Information. A Glossary.

Price $3.00

Cabinet Making

By J. H. RUDD

If you are a worker in wood, whether in the factory or in the school-room, you will be interested.

A book written for the practical cabinet maker, in a practical way. Cabinet Making is not a treatise for beginners, but it will prove as adaptable to the student in the manual training class-room as to the factory worker. Its terse, free style is unburdened with technicalities and offers solutions of your own problems that you can apply in your own way.

Price $1.50

Wood-Turning

Uses of Wood-Working Machines and Pattern-Making

By GEO. H. RESIDES *and* HUGO DIEMER, M. E.

160 pages, 10 x 7, 169 illustrations

Wood-working and pattern-making are more fully treated in this book.

(1) The book is thorough.

(2) It gives a complete series of motion study pictures of wood-turning and wood-working, so that the reader can attain the best results with the minimum of risk and time.

(3) It describes the standard types of wood-working machinery and their uses.

(4) It furnishes a set of detailed working drawings of the sort that emanate from a well-organized drafting-room.

Price $1.50

"Glue Handling"

A Manual for the Practical Glue Worker

By FRIMAN KAHRS

Pocket Edition of 180 pages. Blank pages for writing. Flexible binding, two pockets in cover for clippings, etc.

CONTENTS OF CHAPTER 1

1. Knowledge and System Applied to Glue Handling 19-
Preparatory Work up to 1898.
Work Done Since 1898.
Recent Editorial Comment.
Ancient Methods and Modern Machinery.
The Glue Testing Problem Not Solved.
Glue Testing Figures Must Show Practical Working Capacity
What the Glue Specialists Should Know.
Men Needed as Glue Specialists

Price $1.00

Sent anywhere, postpaid, for the price

WOOD CRAFT BOOK DEPT. CLEVELAND,

The MEETING PLACE of Employer & Employee

Advertisements under this heading FIVE CENTS PER WORD. Copy must be received not later than the 20th of the month preceding date of issue. If you do not find what you require, let us help you.

WANTED—EXPERIENCED FIRST-CLASS ESTIMATOR and practical foreman on interior trim and cabinet work, understanding plans and details with good previous record. Apply The Markert Mfg. Co., Syracuse, N. Y.

WANTED—SUPERINTENDENT FOR FURNITURE FACtory in Indiana. Must be a hustler. Give reference. State experience, age and salary wanted. Address Box 301, care Wood Craft, Cleveland, Ohio.

SUPERINTENDENT WANTED FOR UP-TO-DATE pedestal extension plant. One capable of taking full charge from yard to finishing room. Must understand cost system. Right party may have interest in firm. State salary, experience and reference in first letter. Address Box 300, care Wood Craft, Cleveland, Ohio.

GENERAL SUPERINTENDENT OR FOREMAN WANTS position. Experienced in interior housework, bank, store and office fixtures. Can detail estimate, etc., and practical in all branches. References. Address Box 302, care Wood Craft, Cleveland, Ohio.

WANTED—FACTORY MANAGER TO TAKE FULL charge of new furniture factory, manufacturing cabinet work, furniture or wood novelties. Factory built new in 1913. Must be a man of executive ability, capacity and integrity, able to produce the right quality of goods and market same. Good opportunity for right party. State age, experience, giving references and full particulars. Address Post Office Box 17, Crawfordsville, Indiana.

WANTED—A FIRST-CLASS MAN EXPERIENCED IN the operation of single sticker and four head moulding machines. This is an excellent position and will pay $3.00 to *$4.00 a day, according* to his knowledge and experience. *Steady position and* nine hours per day. References. Further *particulars on request* or can call at plant. Strauch Bros., *22 Tenth Ave., New* York, N. Y.

MANUFACTURING IN CANADA. THE NEW OFFICIAL register of Canadian Boards of Trade gives complete descriptions of commercial cities with industrial opportunities. Absolutely indispensable. Free to firms contemplating establishment of an industry in Canada. Consult us as to location. Mention Province. Dept. F., Heaton's Agency, Toronto.

WILBUR R. SMITH

Industrial Engineering

Woodworking plants, box factories a specialty

609 E. 17th St., Alton, Ill.

MAKE BOX SHOOKS

Up to 24 inches long or Loose Barrel Staves of finest quality and at lowest cost from cordwood, slabs, or other forest waste by the use of Gerlach machinery.

The Peter Gerlach Company. **Cleveland, Ohio.**

FREE SITE FOR BOX FACTORY

Liberal inducements to right parties. Water front. Right in the center of box wood territory. Write to

James H. McDonald,

Secy. Land & Power Co. **Rapid River, Mich.**

FOR SALE

One Linderman Dovetailer, a bargain. If interested, write.

Meisel-Danowitz Company. **45 Eckford St., Brooklyn, N. Y.**

FOR SALE

Fairbanks-Morse 32 H. P. stationary gas or gasoline engine, complete, almost new. A bargain.

Geo. W. Wills. **Canal Dover, Ohio.**

WOODWORKING MACHINES

Hand jointer, 24 in.	$ 70
Boults carver, shaper and dovetailer with reverse friction drive	85
Sander, two 24-in. drums and 48-in. iron disk, good as new	85
Sander, two vertical spindles	25
Saw, double cut-off, 6-ft.	50
Tenoner, single	40
Water grinder	15
Planer, 24-in. Towsley, good as new	125

The C. F. Streit Mfg. Co. **Cincinnati, Ohio.**

FOR SALE

One 31-in. Berlin sander, practically as good as new. If interested, write for price.

The Gorham Brothers Co. **Mt. Pleasant, Michigan.**

FOR SALE

One No. 2 Advance Machinery Co.'s make ball bearing shaper with ⅝-in. interchangeable top spindles, standard length 7 in. Complete with slotted collars and fill-in collars. This machine is absolutely new.

***Victor Talking* Machine Company.** **Camden, N. J.**

MACHINERY SECTION

Lists of Second-hand Machinery, for Sale or Wanted, will be published in this department at the rate of 35 CENTS A LINE each issue (nine words to the line). Name and address are not counted in the space charged for. Copy must be received not later than the 20th of the month preceding date of issue.

REBUILT, TESTED AND GUARANTEED SECOND-HAND MACHINERY

28-and 32-in. single surfacers.
24-in. hand planer.
Double spindle shaper.
Heavy double end tenoner.
8-in. 4-side molder.
36-in. band saw.
Swing cut-off saw.
30-, 42- and 48-in. three-drum sanders.
Large mitering machine.
61-in. double glue spreader.
9 x 38- and 13 x 50-in. sectional veneer presses.
Lot of factory trucks, all sizes.

Mail us a list of your wants.

The John T. Towsley Mfg. Co.

Builders of Modern Woodworking Machinery, Gluing Appliances, Factory and Lumber Trucks, Cincinnati, O.

FOR SALE

W-Dovetailer, Boults	$ 75.00
W-Molder, 1-side, 6-in., Smith	70.00
W-Molder, 2-side, 6-in., Smith	75.00
W-Molder, 4-side, 9-in., Houston	300.00
W-Molder, inside, 4-side, 12-in., Woods	250.00
W-Mortiser, Smith No. 3	75.00
W-Planer and matcher, 9 x 6 Berlin	425.00
W-Planer and matcher, 24 x 5	350.00
W-Resaw, band, American, 48-in. wheel	600.00
W-Resaw, circular, 42 in.	200.00
W-Sawmill, band, 63-in. wheel, carriage 18 ft	750.00
W-Shaper, Indiana, 2-spindle	110.00

Badger-Packard Mchy. Co.

74-76 W. Water St. **Milwaukee, Wis.**

FOR SALE

Manufacturing plant, southern Michigan, 150-horsepower new boiler, 100-horsepower engine with line shaft, ready for operation. Nicely situated in town of 6,000 inhabitants. If taken at once will make price $5,000.00, either in cash or notes properly secured. For particulars apply

The Davis Cooperage Company. **Martinsville, Indiana.**

CUT PRICES

In Modern Woodworking Machines

Band saw stretcher, Covel 8-in., $45.
Band resaw, Cordesman No. 3½, 42-in., used 6 months, good as new, 6 blades, only $350.
Bed clamp, Benedict, $50.
Blower, Sturtevant 25-in. for sawdust, $20.
Box nailer, Doig 6 track, fine condition, $125.
Box matcher with press, Chase, No. 227, pwr. fd., used 3 months, $175.
Combination saw, Burlington, $35.
Cut-off saw, Hamilton Auto Railway, No. 97, $75.
Cut-off saw, Beach, No. 3, box and furniture makers, double, good as new, $100.
Door clamp, Hall & Brown, 8 x 4, good as new, $85.
Engine, high speed Jewel Auto, 38 H. P., $100.
Exhaust fan for shavings, Sturtevant 35-in., $25.
Glue heater, Francis No. 10, $5.
Lathe, Ober Broomhandle, auto, $50.
Lathe, Klotz, nearly new, spoke and handle, $100.
Lathe, Merritt table leg and baluster auto, $125.
Lock corner box machine, used 6 months, $275.
Mortiser, New Britain chain saw with 6 chains, good as new, $200.
Moulder, Colloday, 10-in. 4-side, $250.
Moulder, modern Hamilton, No. 28, 9-in. 4-side, rebuilt, $175.
Moulder, Smith 8-in. 4-side, rebuilt, $125.
Panel raiser, Smith upright hand feed, $45.
Planer, Greaves & Klusman, 24 x 8, double belted, good as new, $125.
Planer, Frank, 20 x 6, No. 101, double planer, modern, fine order, $150.
Planer, Superior 24 x 6 Pony Sgl., $75; Frank 20 x 6 Pony Dbl., $100.
Planer and matcher, G. & W. 26 x 6 4-side, $250.
Planer and matcher, Smith 15 x 6 in. 4-side, 6-roll, $250.
Resaw, Goodell & Waters, 24-in. circular, rebuilt, $75.
Resaw, Smith, 36-in., 4-roll, $125.
Ripsaw, Greenlee, extra heavy, No. 3, circular, $150.
Sander, Cordesman-Meyer, 24-in., iron frame, hand feed, $50.
Sander, H. D., feed, with 2 drums on one shaft, $25.
Sander, Columbia, 36-in., 3-drum, $450.
Saw gummer, Rogers Automatic circular, $25.
Scroll saw, Fay, iron table, $25.
Shaper, Hall & Brown No. 2 double spindle, $50.
Shaper, Hamilton single spindle with 22 reverse cutters, $85.
Siding resaw, McNish & Butler, 24-in., $50.
Stave cutter, Noble 36-in., $75.
Tenoner, Smith, double end, $175.
Woodworker, B. & M. 8-in. Universal and Combined 8-in. 4-side moulder, $200.
Woodworker, Fay 8-in. Universal, rebuilt, $110.
Woodworker, Fay & Egan, No. 77 Variety, with hollow chisel mortise attachment, used 3 months, $125.
Window frame machine, Smith & Phillips Perfect, $175.

This is only a partial list. We have just bought a furniture factory and planing mill. Machines not listed yet. Let us know what you want. We have it and at very low price.

Woodward Machinery Co. 514 Main St., Cincinnati, O.

FOR SALE

Second Hand Machinery

Automatic cut-off saw (new), $150.
Band resaw lap cutter, Bolton make.
Band resaw, late style, 42-in., $400.
Band scroll and resaw, Fay, 42-in., $275.
Belt, cotton, 12-in., 6-ply, 250 ft.
Belt sander with 14-in. belt, Bein make.
Blind clamp, wood frame.
Borer, multiple, 14-spindle.
Combination rip and crosscut saw, B. & M. make.
Cut-off saw, railway, all iron.
Cut-off saw, double, Beach No. 3, $125.
Door clamp, American, 16 dogs.
Double Arbor rip and crosscut saw, Carey make.
Drawer fitter, Egan, with 42-in. discs, $150.
Emery stands, with countershaft and wheels.
Exhaust fan, 19-in. inlet, Buffalo single, $40.
Exhaust fan, 15-in. inlets, Sturtevant double.
Gang rip saw machine, 6 saws, $135.
Grind-stone frame, with 30-in. stone.
Gummer for circular saws up to 30 in.
Hoop Mch., full set, Defiance, 4 mchs.
Jointer, hand planer, 24-in., Egan.
Lathes, for hand turning, 16-in., complete.
Lath saw bundler and equalizer.
Molders, 4-in. 1-side, 6-in. 1-side.
Molder, 9-in., Fay & Egan No. 14, wide open.
Molder, Lehman, 8-in. 4-side, good order.
Mortiser, Houston, cabinet size, $50.
Mortiser, Smith make, heavy, $65.
Mortiser, Egan. grad. stroke, extra heavy.
Mortiser and borer, Cordesman make, $75.
Planer and matcher, 24-in. 3-side, small.
Planer and matcher, 24-in. 3-side, medium.
Planer and matcher, 15-in. 4-side, $250.
Planer and matcher, 24-in. 4-side, Fay No. 2½.
Planer, dbl., 30-in., Hoyt, weight 10.000 lbs.
Planer, dbl., 24-in., Goodell & Waters.
Planer, 30-in., No. 4 smoother, with counter.
Planer, double, 30-in., No. 180, Berlin.
Pony planer, 24-in., Cordesman-Meyer.
Post borer, with table and treadle, $20.
Resaw, circular, 24-in. saw, $85.
Resaw, 4-roll, 24-in., Egan circular.
Sander, Egan 30-in., 2-drum, 8-roll.
Sander, 40-in., Perry make, 2-drum.
Sander, Fay & Egan, 3-drum, 42-in.
Sander, Fay & Egan, 36-in., 3-drum, $350.
Sander, single spindle, all iron, $50.
Self-feed rip-saw, Hoosier, C/S.
Shapers, single spindle, reverse C/S, $60.
Shapers, double spindle, all iron, $75.
Shapers, double spindle, pedestal frame.
Spoke lathe, Egan, 42-in., No. 22.
Spoke lathe, Defiance, 32-in., $250.
Swing saws, all sizes, $25 each.
Tenoner, B. & M. dbl. hds., cut-off saw.
Tenoner, Fay, single head, slide table.
Universal woodworker, with vertical spindle, Bentel & Margedant make, $135.
Variety woodworker, Rechtin, with borer.
Woodworker, 10-in. and 8-in. 4-side, molder combined.

Louis E. Rechtin & Bro. **215 Butler St., Cincinn**

FOR SALE

Used Woodworking Machinery

Band saw, West Side Iron Works, 36 in.
Borers, 3 Andrew single spindle vertical.
Borer, M. L. Andrew 30-in. vertical, 4-spindle.
Borer, Bentel & Margedant, 2-spindle, hor. 1 to 6 in.
Dovetailers, Dodds 9-12-24 spindle.
Edger, Fay & Egan, wood frame 10 ft.
Grinder's knife, B. T. & B. 44-in., Rogers 44-in.
Jointers, Buss 8-in., G. & G. 16-in., Cordesman 24-in.
Jointer, B. & M. 30-in. with power feed.
Moulders, 4-in., 6-in., 7-in., 8-in., 10-in., 12-in. outside.
Planers, Clement 20-in. and 26-in., B. & M. 24-in.
Planers, single cabinet Buss 30-in., 2 Dennis 30-in.
Sander, H. B. Smith 30-in., hand feed.
Sander, Mattison, No. 111 belt.
Saws, tilting table, 2 Am. No. 1, Egan Co.
Saw, double cut-off, Buss 6-ft. 6-in.
Saw, heavy rip, Fay & Egan, for 30-in saw.
Saw, Rowley & Hermance comb. saw and dado.
Shapers, double spindle, Indiana, Buss.
Tenoners, J. A. Fay & Co., W. R. & R. wood frame.
Window frame machine, Smith & Phillips No. 3.

Ask for complete stock list No. 14.

The Chas. A. Strelinger Co.

Woodworking Dept. **96-110 Bates St., Detroit, Mich.**

FOR SALE AT GREAT SACRIFICE

Planing Mill Machinery

1 iron frame swing cut-off saw, $20.
1 120-light electric generator and equipment, D. C., $125.
1 4½ x 2¾ x 4 Duplex pump, $30.
1 Williamsport No. 2 scroll saw, $50.
1 R. & H. combination saw and dado machine, $125.
1 R. & H. post boring machine, $15.
1 No. 129 Fay-Egan planer and matcher, with full sets Shimer heads, for flooring and ceiling, $700.
1 No. 2 30-in. circular resaw (heavy), $200.
1 Fay-Egan 4-in. sash sticker, $75.
1 Smith chisel mortiser, $40.
1 Fay-Egan panel raiser, $50.
1 Fay-Egan arm sander and dust collector, $50.

We have a complete line of Shimer heads for all the latest patterns of sash and door work, ceiling, flooring; and this machinery is in first-class condition. It is offered at these very low prices in order to close it out quickly.

Have It Examined

We will be glad to have you come in person and examine this machinery. If it is not convenient, you could secure the services of an expert by writing to either of the following reliable Chattanooga concerns: The Chattanooga Machinery Co., The Wheland Machine Works, The Patten Mfg. Co., Gladdish Bros., Machinists, or Street Bros. We will sell the above in part or will consider cash offers on the whole.

Write or see

'erger Bros., Agents. **Chattanooga, Tenn.**

BARGAINS EXTRAORDINARY

WOODWORKING

1 10-in. 4-side molder, Colloday.
1 36-in. automatic knife grinder.
1 16-in. hand jointer, Goodell & Waters.
1 Alber stair router.
1 30 x 6 J. A. Fay & Co. double surfacer, divided feed rolls, cabinet type, A-1 condition, $300.
1 30 x 8 Money Maker double surfacer, weighing about 10,000 lbs., A-1 condition, $400.
1 15-in. 4-side inside matcher, J. A. Fay & Co. make, fine condition, $250.
1 7-in. 4-side Holmes Atlantic inside matcher in fine condition, $200.
1 15 x 6 J. A. Fay & Co. inside matcher in fine condition, $250.
1 15 x 6 J. A. Fay & Co. inside matcher in fine condition, $350.
1 24 x 6 planer and matcher, 4-side.
1 2-saw edger, 24-in., in fine condition, $50.
5-Cabinet single surfacer.
2 Tenoning machines.
2 Double cut-off saws.

SPECIAL BARGAINS IN SANDERS

1 42-in. 3-drum Perfection sander, thoroughly overhauled, $350.
1 48-in. 3-drum Thomas sander, $400.
1 48-in. 3-drum H. B. Smith sander, $500.
1 54-in. 3-drum J. A. Fay & Co., fine order, $500.
1 48-in. 3-drum Royal Invincible sander, $550.
1 60-in. 3-drum Columbia sander, in A-1 condition, $600.

JOINTERS

1 18-in. Crescent hand jointer.
1 16-in. Goodell & Waters hand jointer.
1 18-in. Crescent hand jointer, in A-1 condition, $90.
1 30-in. Buss extra heavy hand jointer, $125.

Woodworking machinery of all kinds.
Write, stating your requirements.

CLEVELAND BELTING & MACHINERY CO.

1922 Scranton Road, Cleveland, Ohio

Woodworking Machinery

The New Cabinet Planer

The NEW CABINET PLANER is fitted with NEW ROUND HEAD and JOINTING and GRINDING ATTACHMENTS

Made in Several Sizes

Address for Special Circulars

H. B. SMITH MACHINE CO.

SMITHVILLE, N. J., U. S. A.

New York **Chicago** **Atlanta** **San Francisco**

CLARAGE

FANS—BLOWERS—EXHAUSTERS—ENGINES

Send for a copy of our new catalog W-C-3. It describes our Steel Plate Fans—engine and pulley driven—Clarage Heater Coils for Hot Blast Factory Heating Installations, and Blower Dry Kilns.

This catalog also shows small fans, both Exhausters for handling shavings, dust, etc., and Clarage Volume or Pressure Blowers.

Every Clarage Fan, Blower or Exhauster, is equipped with our special Clarage Bearings, with oil reservoirs absolutely dust-proof.

Catalog mailed on request

CLARAGE FOUNDRY & MFG. CO.
HEATING, VENTILATING AND DRYING ENGINEERS
KALAMAZOO, MICH.

EASTERN BRANCH — 149 BROADWAY, NEW YORK, N. Y.

SPEED

That's what you really secure when you own a

Chain Saw Mortiser

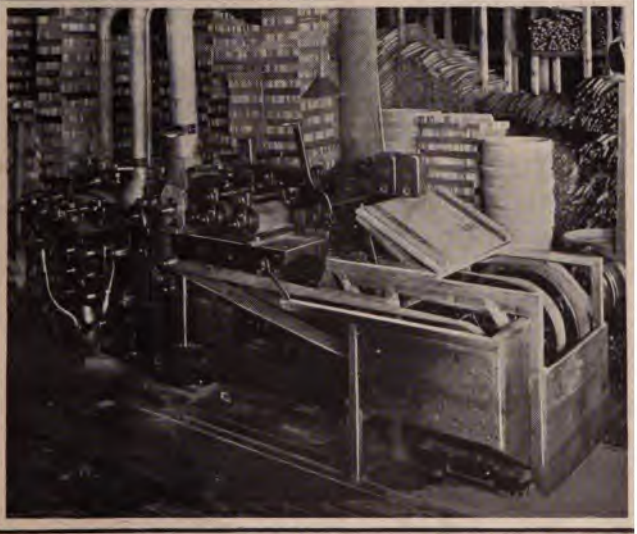
Makes a mortise 6 inches deep in 6 seconds without any boring or leaving any core to clean.

Investigate this new machine. It will revolutionize this department of your plant.

The New Britain Machine Co.

16 Chestnut St. **NEW BRITAIN, CONN.**

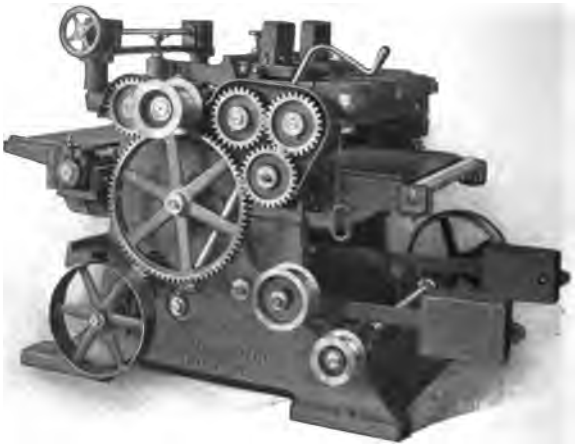
WOODCRAFT



JUNE ··· 1914

A Combination Single or Double Surfacer

Power's No. 14



ONE of our latest designs, and one of the finest products Power has built to date for the practical woodworking trade.

This Surfacer is a simple, compact and wonderful machine for handling even the hardest kinds of stock.

Our folder, fully describing this No. 14 Surfacer with its divided or solid rolls, will be sent you upon request. Write us today for a copy.

Wm. H. Field Co.
Boston, Mass.

Olney & Warrin
New York

L. Power & Co.
6 South 23rd Street
Philadelphia, Pa.

Eby Machinery Co.
San Francisco, Cal.

Zimmerman-Wells-Brown Co.
Portland, Oregon

We make Band Saw Blades of Imported Steel
They Last Longer

Handy Clamps are Better

No. F
Screw is 2 inches above Tempered Steel Bar

No. C
Tempered Steel Bar Clamp

Guaranteed not to buckle the work.

Tempered Indestructible Steel Bar Clamps. Screw works in two bearings, increasing the life of the clamp over 100 per cent.

"Handy" Patented Steel Spindles and Steel Nuts on "Hand Screws" guaranteed not to break.

No. A

Can be kept rigid or attached in any position.

Strongest Hand Screw Made

Works nearly ***twice as fast*** as common wood screws. Spindles have a right and left hand thread. Gives a tighter grip and less power required. Glue cannot stick to spindles. Handles guaranteed not to get loose. Jaws are best seasoned maple.

Try our "Mitre" Clamp also our "Frame" Clamp.

....ORDER SAMPLES....

Send for Catalogue and Prices of Full Line of Clamps

HANDY MFG. CO. 27 E. Madison St. CHICAGO

Benders

Of course the bending of stock comes up in your line, and many times you may say "That is all right for So-and-So, but our work is different."

Mr. Manufacturer, you are the one we want to have write us and send drawing of what you are sawing, and then we can tell you if our machines will do the work, and the saving it is over sawing of stock.

Benders Exhibited at Chicago Machinery Exchange, Chicago, Ill.

L. G. McKnight & Son Co.

Gardner, Mass.

Published by
THE GARDNER PRINTING COMPANY
CAXTON BUILDING · CLEVELAND, OHIO

VOL. XXI JUNE 1914 No. 3

WRINKLES FOR WOODWORKERS

To take chances enhances danger.

Safety equipment goes ill without coöperation of users.

Carefulness around machinery isn't therefore cowardice.

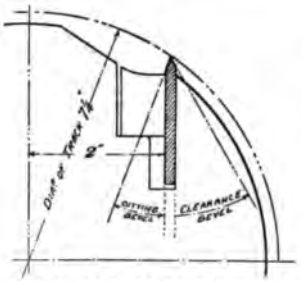
There's no just pride in being foolhardy. Narrow escapes from injury are lessons in caution, not excuses for boasting of luck.

Neglect no injury. Slight may be the cause that *leads to blood poisoning.* Competence, if not life *itself, depends upon* bodily fitness as well as *mental activity.* Health is efficiency.

CUTTING ANGLES OF KNIVES FOR WORKING WOOD

Condition and kind of the wood that is being cut have marked influence on the cutting and clearance angles of the knives—details in brief and practical form of these important angles given for handy reference

ANGLES of planer knives are varied on the cutting edges according to the make of the machine which settles the particular form of head holding them, and they also vary advantageously, according to the condition and the kind of wood that is being cut.



Angles of Cutting Edges on a Thin Knife for the Planer

Accompanying figures are credited to the S. A. Woods Machine Co., Boston, Mass. For other diameters of cutting circles swept through by knife edges and for any variation in support of knives due allowance must be made. The engraving shows respective angles of the cutting and the clearance bevels. The softer the wood and the more unseasoned it may be, the less the bevel given to the cutting face of the knife.

But with thoroughly seasoned oak, beech, birch, ash, maple, elm, and similar woods the case is different, and the cutting action then more nearly looks like scraping than paring away the stock.

With the softer woods the bevel, or clearance, is *back* of knife, and front edge of knife is un-

Material	Bone dry	Dry	Air dry	Wet	Green	Mixed
	Dgs.	Dgs.	Dgs.	Dgs.	Dgs.	Dgs.
Yellow pine	25	20	20	15	0	15
White pine, spruce	20	15	10	0	0	10
Norway pine, hemlock fir, larch, poplar, gum, elm.	25	20	15	10	0	10
Cedar, redwood, cotton-wood, basswood, cypress	10	8	0	0	0	0
Oak or ash	25	25	20	0	0	20
Beech, birch	30	25	25	20	20	20
Maple	30	30	25	20	20	25

Table A. Cutting Angles of Planer Knives for Working Various Woods in the Several Stages of Dryness

Material	Bone dry	Dry	Air dry	Wet	Green	Mixed
	Dgs.	Dgs.	Dgs.	Dgs.	Dgs.	Dgs.
Yellow pine	25	20	20	25	30	25
White pine, spruce	20	25	30	30	30	30
Norway pine, hemlock fir, larch, poplar, gum, elm.	15	20	25	30	30	30
Cedar, redwood, cotton-wood, basswood, cypress	30	30	30	30	30	30
Oak or ash	15	15	20	30	30	20
Beech, birch	0	15	15	20	20	20
Maple	0	0	15	20	20	15

Table B. Clearance Angles in Degrees of Planer Knives for Working Various Woods in the Several Stages of Dryness

touched. With hardwoods the clearance bevel at back of knife becomes a minimum, or is actually zero, while the knife edge in front gets a bevel of sometimes quite generous amount. Tables of the respective degrees of beveling for the different woods at their several stages of seasoning and dryness show this matter clearly in detail.

Knives should be maintained firmly solid at cutting edges, tendencies to vibration are the more carefully to be met and corrected with thin knives or the results will offset the other advantages of this class of cutter.

ELECTRICITY FOR LIFTING SHOP AND SHIPPING ROOM LOADS

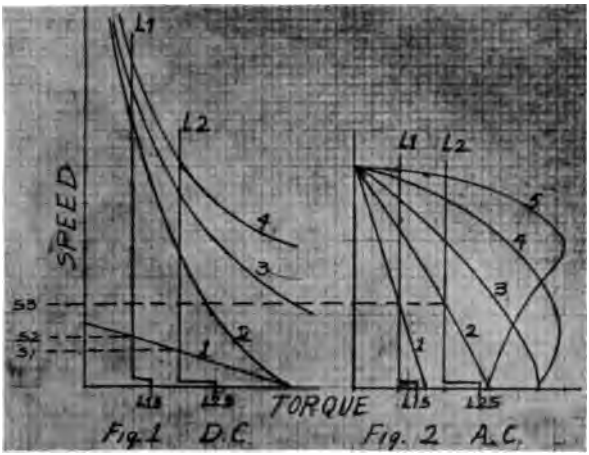
Differences in the operation of the two classes of equipment and an explanation of the principles pertaining to a peculiar feature of controller apparatus

AN explanation recently offered by R. H. McLain, of the General Electric Co., presents the reason why in hoisting there exist certain differences between the operation of alternating and direct-current machinery.

He says that direct current is better as regards slow speeds of hoisting than alternating current but where mechanical load brake is good and if proper hook speed is used there are few cases where it is necessary to go to any extra expense to obtain direct current if alternating current is form of power generated. But there are cases where it proves best to use direct current. His company in its plants uses both systems to advantage for this purpose.

Difference between speed control of an alternating-current and a direct-current hoist or crane is illustrated. Illustration shows that curves are plotted in Fig. 1 between torque on motor shaft and speed in revolutions per minute. Curves 1, 2, 3 and 4 represent speed conditions on points 1, 2, 3 and 4 of a controller. Curve 1 is obtained by connecting resistance in series and in shunt with arma-

ture. Curves 2, 3 and 4 are obtained by series resistance. Vertical lines L1 and L2 represent torque required to raise a light and a heavy load respectively. L1s and L2s is torque required to break static friction on L1 and L2. Evidently speed where curve 1 crosses L1 and L2 is nearly the same.



Illustrates the Reason for Certain Puzzling Peculiarities in Electric Crane Control and Controllers

Fig. 2 is made in same manner for alternating current but no such expedient is obtainable for curve 1. It must be obtained by series resistance and is steep instead of flat. Therefore point 1 of controller will give a creeping speed for light load (L1) but point 2 must be used for heavy load (L2). Even *then speeds are* not so slow as point 1, direct current *in Fig. 1, but* within limits just as slow a speed *can be obtained* by turning controller "on" and "off"

rapidly. This is done frequently in practice but requires more care and skill of operator.

Where it is strictly required that creeping speed does not exceed fixed low percentage of full speed, direct current is the only solution. How low this percentage must be to make direct current imperative is in Mr. McLain's opinion dependent largely on the builder of hoist and the ratio of L1s to L1 and L2s to L2. If a great deal more torque is required to start load than to hoist it the alternating current hoist jumps much more than the direct current one.

In general alternating current is best form for power because cheaper than direct current. On other machines than hoists or cranes there is no doubt but that alternating-current motors are better than direct-current ones because outside of bearings they are not injured by floating dust whereas the direct-current motors are to be inclosed because of commutators.

Large continuously running machines may well be driven by synchronous motors and installed far away from dirt. This type can have a leading power factor and compensate for the lagging factor of induction motors used in other parts of shop. This feature is especially valuable where central station power is used or where motors are installed at great distance from power station because it helps line regulation and reduces line losses.

Confidence in safety, knowledge of all risks, and *fully instructed*, the workman is headed efficiently *on his job*; subsequent production then depending *on skillfully* applied pressure.

THE RULE-OF-THUMB MANAGER'S METHODS

Hitting the rule-of-thumb man over the knuckles

HE doesn't analyze his business and its possibilities to find out the real reason for his success or failure. He hasn't time. He is "too busy doing things."

In the hiring of people, his ideal is to "try them out—see what they can do." The try and fail method is a gospel to him. He solemnly asserts that "you can't tell what any man is able to do." That other concerns are foretelling and finding out what types of men are necessary for certain jobs, are pre-determining what men will fit the jobs and then getting the men to fit the jobs, is a joke to him.

Of course you can't tell him anything about it because he doesn't know anything about it.

He doesn't know anything about the idea because he has never seen it at work. If he did see it, he would probably dismiss it with, "The Employment Manager was better than usual;" but as for finding law or principle in any course of action, he dismisses it with, "It is the man who is doing the work, and the man who is getting the results."

The rule-of-thumb manager prides himself upon "knowing his business." He never thinks of using outside counsel. If a man would suggest to this type of mind that there is a better way in which to grind a knife, his first question would be, "How many knives have you ground?" In other words, his attitude of mind is of the man looking in the mirror when he is looking for all the reason for success.

It is a type of mind of which we have had entirely too many, and which competition and the efficiency of skilled minds, applied to skilled work, is gradually forcing out of American business. These rule-of-thumb managers act as the priests of old, adopting a precedent as a sacred flame which has passed from hand to hand, from generation to generation, each keeping it inviolate, never changing it, until it becomes a sacred tradition before which youth, and skill and brains and power must bow in submission. The rule-of-thumb manager is always a liability and never an asset. He may be popular, he may have succeeded, he may be succeeding, but just as inevitably as the sun rises, his day is done.—E. St. Elmo Lewis of the Burroughs Adding Machine Co.

VARIABLE SPEED AIR SPREADER

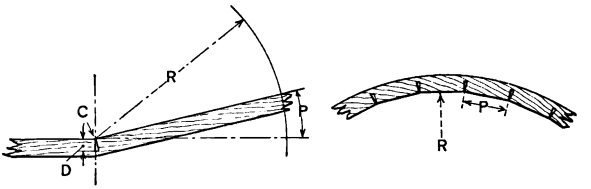
GOOD paddles on the lineshaft in hot weather are an expedient in many plants to improve ventilation and keep down temperature. Insurance companies do not encourage them, and on account of their element of danger another device has been brought out by the Diamond Clamp and Flask Co., Richmond, Ind. This is a four-bladed fan turning in a horizontal plane and is belt-driven, the power passing through a friction drive. A rod comes down conveniently overhead and on reaching up to this rod, and turning the handle, the friction wheel is brought into action and fan speed can be regulated to suit temperature of room. *Blades* are steel and shaft bearings require *attention.*

Let every man be fitted safely to his job.

SAWING WOOD FOR NEATLY BENDING INTO CIRCULAR FORM

A convenient method of spacing saw cuts to close when wood is bent to correct contour of the pattern

IT is often found necessary in emergencies where but one or only a few pieces are required to make or increase the diameter of circular work by bending or lagging with thin boards, to get out the required bend by means of saw cuts extending about three-quarters of the way through the stock.



Getting the Saw Cuts Into Wood So That Strip When Bent to Shape Closes Up Nicely

The usual method is to put in plenty of cuts, guessing at the spacing. A neater job is turned out if the spacing is such that when the bend is made the edges of the saw kerf come closely together.

Following is a brief description of a quick and accurate method given by G. D. McRoy in the "American Machinist," for determining spacing of cuts for a given bend. Depth of saw cut is first decided; that depends on wood used, thickness of board, and amount of curvature. Next, circle to which wood is to be bent is laid out on a board or other suitable surface.

Taking a board of the size to be used, and making

one saw cut, having a depth D, the board is placed on edge, with its inner edge on center line of circle laid out, the saw cut being at center C. Board is then bent until edges of cut meet, the distance swept on circle, represented by P, is pitch distance of the saw cuts, such that when the board is bent so that its concave side has a radius R, the cuts will be closed.

FEED WATER DIFFICULTIES IN MANUFACTURING PLANTS

Points out the substantial saving to be gained by getting expert advice for plants on technical topics

PROBLEM of suitable feed water, although less serious in New England than in other parts of the country, is still a trouble maker in many plants. The formation of scale and the softening of water are due to the simplest of chemical reactions, and by an analysis of the water a competent chemist can readily predict in advance the proper amounts of suitable chemicals necessary to prevent scale or corrosion, and not only save the company the expense of frequent boring and replacing of tubes but obviate the necessity of attempting to force heat through the same substance with which many of your steam lines are insulated. "The services of a chemist," says Carl F. Woods, with Arthur D. Little, Inc., of Boston, Mass., "would prevent the purchase of a special compound at $1,000 a year which consisted of 97 per cent water and 3 per cent molasses, or obviate the necessity of purchasing a mixture of soda ash, tannin and water under a brand name at 8 cents a pound when the principal ingredient can be obtained for 1 cent a pound."

CARE OF IDLE BELTS ON HIGH SPEED MACHINERY

Shows various means for safely supporting the belt when it is to be separated temporarily from pulley

ECONOMY of power and a lessening of the wear and tear of belts is a frequent cause of a driving belt being thrown off the pulleys until the machine is again to be used. Belts may also slip off the pulley accidentally or they may be put off intentionally in order to make

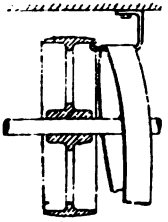


Fig. 1

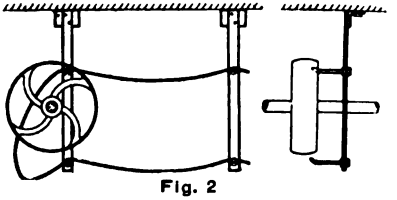


Fig. 2

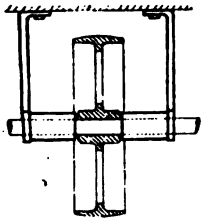


Fig. 3

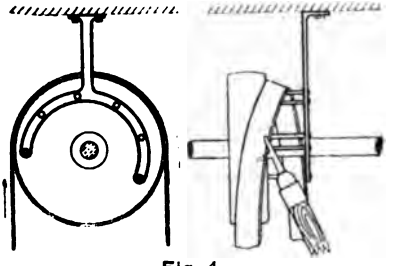


Fig. 4

Fig. 1 Simple Belt Support
Fig. 2. Belt Supports for Horizontal Belt
Fig. 3. Sleeve Style of Belt Support
Fig. 4. Belt Pole and Improved Type of Belt Perch

repairs. When the belt so removed rests upon the rotating shafting there is danger of the shaft seizing and rolling up the belt.

Even a belt loosely resting on a moving shaft with apparent safety for everybody may suddenly have its frictional resistance between belt and shaft greatly increased when anyone takes hold of the belt, and the unfortunate person may then be carried off his feet and severely injured.

Belt and shaft may be kept apart by a strong hook, Fig. 1, somewhat longer than width of the belt, and the end of hook turned up under the pulley rim. This works well with a vertical belt if hook is secured fast against weight and any other possible pull of belt. As belt is likely to come off pulley with a jerk, the hook must be carefully made and placed.

For a horizontal belt there may be double supports as in Fig. 2, care being taken that the lower support be not so near to pulley rim that belt can jam between them.

Fig. 3 shows how a sheet-iron sleeve or trough riveted to bracket may support belt when required and keep it clear of shaft. As it may be desirable to be able at pleasure to hang belt on either side of pulley the support can be made double, as in Fig. 3.

Another type of belt perch is Fig. 4, where several parallel pegs with outwardly bent ends are riveted firm to a curved support, this curve nearing the rim diameter at the point where belt would be pushed on to or off pulley in shifting.

Fig. 4 also shows the familiar belt pole at right. For belts not over 3 inches wide a strong but light pole, say 1½ inches diameter, carrying at upper end a wrought iron or steel pin at right angles to pole axis. A forged T can as in Fig. 4 be driven into pole

end and guaranteed there by a substantial ferrule around pole.

Some ingenious belt poles are of jointed or flexible type and allow the holder of pole to be protected against any injury when moving pulley takes a grip on the belt. Length of pole is preferably longer

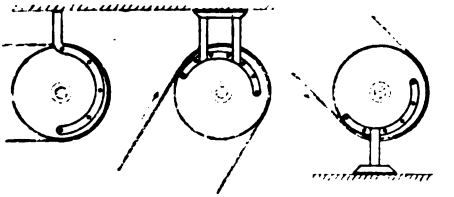


Fig. 5. Improved Belt Perches in Several Positions

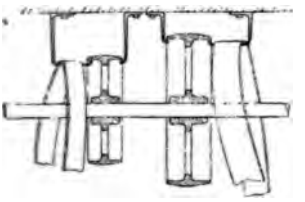


Fig. 6

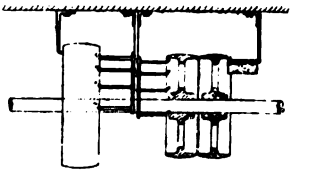


Fig. 7

Fig. 6. Simple Belt Perches
Fig. 7. Types of Belt Perches and Guides

than height of shafting from floor. A loosely turning sleeve on the pin is also an advantage as being less likely to injure or catch belt when it should be free.

Design of the support in Fig. 4 can easily be modified as in Fig. 5 to suit various angles of driving belts.

When *pulley is close* to bearing, or if two pull

are close together, the belt rests can be arranged as in Figs. 6 and 7 to keep belt from falling between pulleys or between pulley and bearing.

Tying the belt up to the ceiling above shafting leads the unfortunate workman usually near to unfenced machinery and has been the cause of serious injuries and some fatalities.

THE PRACTICAL EMBOSSING OF WOOD

A few wrinkles of consequence in reference to the preparation of wood for embossing purposes and a handy method of testing working temperature of dies

ONE of our correspondents asks for information as to the treatment of wood for embossing. What could be done to make the stock work at its best?

The question was referred to G. W. Lenz, president and general manager of the Lenz Art, Die and Machine Co., Indianapolis, Ind., and he advises that "there is no treatment whatsoever to give to the stock before embossing except that the wood should be dry, perfectly. Air-dried lumber gives some better results than kiln-dried. It is also to be understood that the dies which do the embossing are heated to a temperature best determined by showing a slight tarnishing of the wood while it is being embossed."

Circular from the Stow Mfg. Co., Binghamton, N. Y., describes an electric two-spindle portable drill. One spindle fitted with Jacobs chuck takes S. S. drills 0 to ½ inch, and the other spindle takes T. T. drills 0 to ¾ inch.

SAWING WOOD TO SHAPE FOR INLAYING

Guessing at the tilting of the table is too tempting a plan whenever there may be doubt as to best way of getting accurate results, so here are a few pointers on an exact method of obtaining the desired particulars

DIFFICULTIES in the gaging of the exact tilting of the table when sawing on a bevel the several thicknesses of stock for inlay work are due to the differences in thickness of sawblade, the thinner the blade the less the cutting angle required for correct fitting of the wood,

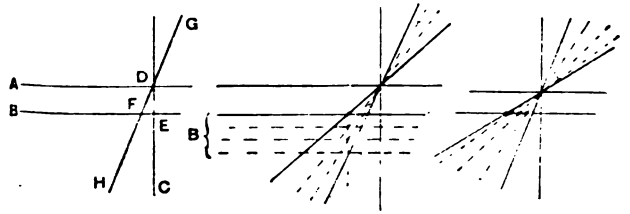


Fig. 1 Fig. 2 Fig. 3

Obtaining the Various Angles for Tilting Saws in Cutting Thin Woods for Inlaying

and the thicker the material sawn the less the angle of bevel required. Where a thick sawblade and a thin panel come together in bevel work the cutting angle is a very objectionable maximum.

Some inquiries have appeared along this line and the following graphical method of laying out the work is offered: Draw two parallel lines horizontally, as A and B in Fig. 1, their distance apart representing thickness of one panel. Draw a vertical line C, cutting A and B and D and E. On B, measuring from E, mark off exact thickness of sawblade, and call this F. Through D and F dra-

line G H, which represents the cutting angle. Take angle by protractor or otherwise, and set table. If thickness of material and sawblade are same, such a diagram would give a square, and line G H would be at angle of 45 degrees.

Those working in thin wood may feel that above method calls for precise drawing to insure accuracy. No fear need be entertained. Say panels are 1-16 inch and the saw 1-32 inch, multiply, say eight times, and set diagram out from these enlarged measurements, which in this instance would give panel as 1-2 inch and saw measurement as 1-4 inch, which are sufficiently visible to render drawing of diagram an easy task. Fig. 2 shows effect of thickness of material on required bevel, and Fig. 3 gives result of varying caliber of sawblade.

Contributor to "Work" who submits the above method also points out that one other point obviates all need for bevel, rendering it possible to cut out many panels at once without extra fine blades.

The suggestion is to cut vertically, with a saw of about 1-32 inch, woods of two colors, both of middle tint, and then lay in all around the pattern a slip or purfling of very dark or very light wood or other material. If a white or nearly white outline is chosen, then lighter of two woods used as pattern, and background should be a shade darker than outline. If black or nearly black is used as outline, then the darker of the two panel woods should be a shade or two lighter than outline. Such a scheme might involve extra trouble in bending and cutting outline; but it is capable of extremely aristic effects, and gives one also the artistic advantage of an outline between woods of different colors or shades, a factor not to be despised in good decoration.

THE MAKING OF WOOD FROM SAWDUST

Tells how the steady stream of sawdust from machine woodworking is to be turned back on its tracks and made over into something like what it was at the start

POPULARITY of the electric drive, and the frequent dependence upon a central station supply of energy, make the sawdust problem always one of very general interest. An inviting subject of investigation has been the cementing of the sawdust into a solid material. Most of the present-day successes of this class are based upon the discoveries of the French chemist, Sorel, who in 1855 found the cementing uses of the oxychlorides of zinc. He later produced colored mosaics and billiard balls by wetting a mixture of sand or sawdust with a solution of magnesium chloride.

For outdoor uses the material is not proof against weather as it is easily influenced by water, and in competition with stone or the usual Portland cement is too expensive to hold its own.

The composition has a better chance for indoor uses but here too it must be protected by an oil finish or otherwise from attack by moisture, as by the washing of the surface it will soon be destroyed.

Such a magnesium-sawdust composition is in Europe known by many names, the most expressive being "Steinholz," "Xylolith," and "Lignolith." While heavy and cold to the touch, they are excellent non-conductors and have other good qualities.

Most mixes of this material allow of the driving into them of carpet tacks, but if the inert filler in the mix is in very fine powdered form they are liable to crack when tacks or nails are driven. For this rea

the common coarse sawdust is preferable to any finer substance such as sand, and therefore the process holds out very attractive possibilities to those whose sawdust output is uncomfortably pressing a problem of waste disposal.

Hardwood sawdust is of course preferable to pine or other softwoods because it is less absorbent. Sawdust from the hardwoods makes up for their greater first cost as it does not withdraw such a large proportion of chloride solution which would otherwise combine with magnesia to form cement.

Adding hair or some other fibrous material to the paste when mixing the sawdust and chemicals has been found to do very much to prevent splitting when nails are driven.

A good polish is said to be possible by waxing, but until recently the results have looked "cheap." Recent compounds have been very much superior in effects to earlier results.

A comprehensive article on the subject has appeared in the "Building News," and was prepared by Alfred Lang, 7a Princes street, Westminster, S. W., England, from whom additional information can doubtless be obtained on this promising system of sawdust utilization.

Hydraulic Press Mfg. Co., Mt. Gilead, Ohio, has greatly enlarged its plant by additions to foundry as well as the erection of a new erecting shop, 120 by 80 feet and 54 feet high. Switch from New York Central lines runs through end of building and shop crane can operate directly over cars. Company by this enterprise shows its firm confidence in the teady betterment of prevailing business conditions.

GETTING THE MOST FROM THE GRINDER

Reasons why abrasive wheels fill up or glaze over, and some suggestions for the cure of these evils

ABRASIVE wheels get shy on cutting when they fill up or glaze over. Space between the cutting particles fills up with the ground-off metal and the few projecting bits left of abrasive material or wheel circumference then receive too much for them to bite off and they lose their teeth under the pressure, and are rubbed down and glazed over.

Filling, says "Grits and Grinds," may be caused by the wheel running at a speed below that for which it is designed. It may also be caused by crowding a hard wheel to a greater depth of cut than the size of the projecting grains of abrasive in the wheel.

When the cutting particles of a wheel have become dulled or worn down even with the bond that holds them together, and the bond is too hard to wear away and give clearance between the cutting particles, there is glazing. In that case the bond prevents the dulled particles from breaking off and permitting new particles to get to work.

Too hard a wheel or too fast a speed, or both of these, will cause glazing.

Wheels too hard or too slow cause filling. Wheels too hard or too fast cause glazing.

When another wheel is not readily obtainable and the one in use seems too hard, which by the way usually calls for more power than wheelmaker recommends, then cut down speed and dress wheel with sharper diamond. Sharp diamond leaves wheel

surface with added clearance and it will cut like a softer wheel for longer time.

If wheel appears soft so that it wears away rapidly, the speed should be reduced and grain depth of cut thus diminished.

SECTIONALIZING THE EXHAUSTER SYSTEM BY SMALL MOTORS

Value in regulation of small individual fan motors

WHERE exhaust fans are required it is usually advisable to sectionalize system and operate relatively small blowers individually by direct-connected motors in preference to large blowers serving single systems. Pressure required in the different sections of plant can be readily adjusted by varying the speeds of driving motors, and when only part of the plant is operated, cost of current will be directly proportional to useful volumes of air exhausted.—R. H. McLain.

At annual meeting of stockholders of the Joseph Dixon Crucible Co., Jersey City, N. J., April 20, 1914, the Board of Directors, Geo. T. Smith, William Murray, George E. Long, Edward L. Young, William G. Bumsted, J. H. Schermerhorn and Harry Dailey, was unanimously reëlected. Stockholders expressed satisfaction with management and made record vote, 9,628 out of a possible 10,000 shares being represented. Geo. T. Smith, president; George E. Long, vice-president; J. H. Schermerhorn, treasurer; Harry Dailey, secretary, and Albert Norris, assistant treasurer and assistant secretary, were also reëlected.

REGULATING OUTPUT OF FURNITURE FACTORY

Keying up the shop production so that it keeps pace with the demands on the shipping department — a simple scheme has a single sheet supplied with figures by the manager himself and enabling him to keep a helping hand on the throttle valve of shop pressure

PENNSYLVANIA furniture manufacturer, making to stock, had trouble keeping production in step with shipping requirements. This or that pattern would suddenly run out and, pending the execution of a rush order, all shipments were held up.

Number of rush orders became so large as to disorganize shop for regular production. Hardly a stock order pursued its way uninterrupted. Sidetracking an order meant a congestion of floor space, further handicapping operations. Too frequently, parts thus sidetracked would fail to resume journey. When needed for assembling, they would, on hasty search, be missing. Recourse, as usual, was a rush order.

Finally a production expert set about devising a simple production scheme, by which the executive could regain his grip on factory. Several forms were required, including a new manufacturing order, an identification ticket to accompany work through mill, individual time notes for men, and departmental delivery records to check delivery of parts forward from one department to the next. Principal form, however, was a Record of Production and Shipments illustrated and described in "Factory" for June. By it a perpetual inventory can be maintained on finished stock and on production in

each stage. This record the manager himself keeps.

This form is a 10 by 17¼-inch ruled sheet, identical on both sides, with the exception of the topmost column headings. These on one side are from January to June, and on other from July to December. A single sheet answers for a year for one pattern. There is a sheet for each pattern manufactured and these are kept in a spring-back binder, classified. All chiffoniers are together, and all buffets. Pattern numbers in each group are then arranged in order and thus made to serve purpose of page numbers as well. Tabs, stuck on the initial sheet in each class, enable almost instantaneous location of any pattern number.

First column on the form is for the manufacturing-order number; the second, for the date this order is issued; the third, for the date the initial mill operation (cutting-off) is completed, which means that all parts are started through the mill; the fourth, for the date the mill operations are completed and the parts delivered to the cabinet department for assembling; and the fifth column for the quantity in the lot.

Next four columns, under the secondary heading, "Cabinet Work Done," are provided, the first for the date and the other three for the quantities finished—bases (B), standards (S) and caps (C) being listed separately—as the cabinet work and also the finishing is performed separately on these three sections which only finally come together in shipping room. If there is but one section to the final piece, only the first column is used.

Four similar columns follow under the secondary heading, "Finished." Quantities here listed are

available for immediate shipment if necessary, but ordinarily go into stock.

Next single column contains the days of the month, numbered from one to thirty-one, and fixes the position, according to date, of all quantities posted to the right of it.

Then follow, under the names of months, six groups of columns of eight divisions each. These in turn are arranged in two groups of four divisions each—one for the listing of pieces shipped, the other for record of balance on hand. First column in each secondary group is for the record of "Full" pieces shipped or on hand. Remaining columns are for the separate accounting of bases, standards and caps.

Thus a perpetual inventory is had of entire production. A glance shows not only balance on hand of finished stock but quantity, if any, in course of production at each important stage. Maximum and minimum limits are set, and so soon as balance on hand reaches a minimum, if shipping orders are continuing to come in at regular rate, a new manufacturing order is issued.

By adding at end of month the "Shipped" column, the total shipments for that month are obtained. This total must agree with shipping room records. By subtracting this total from balance on hand at beginning of month (plus pieces delivered to finished stock that month, if any) the balance on hand to carry forward is obtained. This should agree with final figure in the current Balance on Hand column.

Easier by far nowadays to sharpen up than to wor

SOME BELT SHIFTERS AND THEIR SAFETY

Putting the belt on and off a pulley and the means permitting the belt that ceases to drive to be brought to a halt when thus it is not required to be at work

TO slow or stop machinery while a belt is put on is always an interruption to output that becomes the more objectionable the greater the size of the plant interfered with in this way. Furthermore, there is a considerable saving where an unnecessary belt can be stopped while it

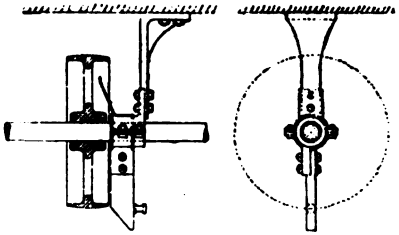


Fig. 1. Boudoin Device for Belt Shifting

is not absolutely required to be active. Just how to handle the situation safely has brought out sundry inventions of much ingenuity and effectiveness.

Fig. 1 is the Boudoin belt shifter of 1871, invented at St. Sauveur-Luxeuil, Alsace. An arm with beveled edge is bolted to a socket free to rotate on a fixed sleeve on driving shaft.

To replace a belt on pulley the wooden arm in Fig. 1 is turned through arc of circle by a pole having a hook that catches onto a knob near lower end of arm. Beveled edge of arm then picks up the belt, allows it to slide onto pulley at point of intake and

prevents it from slipping off pulley as it travels around rim.

Another type of belt shifter, Fig. 2, has been adopted by the Italian Association for the Preven-

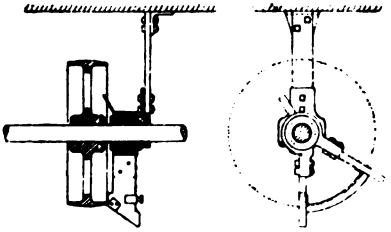


Fig. 2. Italian Type of Safety Belt Shifter

tion of Industrial Accidents. It resembles Fig. 1, but lower half of socket has two arms at angle of 60 degrees and connected by a metal band of like contour to pulley rim, see Fig. 2.

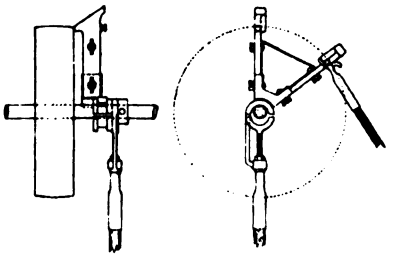


Fig. 3. Boudoin Belt Shifter of Portable Type

A portable device of Boudoin type is Fig. 3 and can be used for shafts and pulleys of different diameters. Sleeve is in halves, lower part having a screw engaging a nut at end of belt pole. This sleeve is

readily placed over any shaft within reach of pole and then simply turning the pole brings together the sleeve halves. Wooden arms on socket have

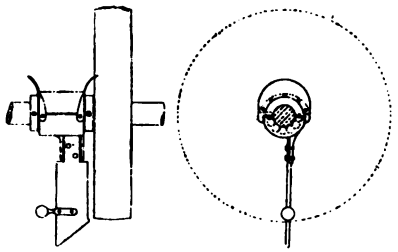


Fig. 4. Belt Shifter of the Brancher Type

slots to permit adjustment to different pulleys. Hook on pole rotates arms to shift the belt to pulley.

Brancher belt shifter, Fig. 4, omits the supporting

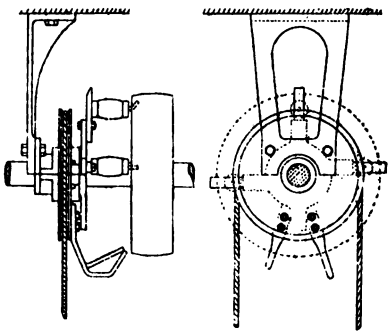


Fig. 5. Cowley's Safety Belt Shifter

bracket and sleeve of the Boudoin devices. Socket carrying arm is suspended on shaft close to pulley and between shaft collars. Upper half of socket has

metal wings to support belt from contact with the shaft. Socket has small hardwood rolls working in thick lubricant to prevent any tendency of metal surfaces to seize.

A light V-rimmed pulley attached to sockets on these devices allows them to be operated by cords or chains. Poles are often missing when wanted and then there is the temptation to replace belt by hand. The chain or cord makes the device self-contained.

Other arrangements have been developed for the same purpose. Some have metal arms supporting belt and to be turned around shaft by pole, cord or chain. Some have small rollers on parallel pegs at side of pulley and slightly eccentric to its rim. Belt is then pushed over by forked levers working together by links, or the belt support is moved toward pulley by a rack and pinion operated by a cord, latter device having conical rollers to help in lifting belt into place.

A belt shifter of English type, Cowley's patent, is seen in Fig. 5. General principle of its construction and operation will easily be noted on a comparison of it with the other devices here shown.

A number of contrivances for use on cone pulleys have been devised. Operators of this class of machinery are usually very expert but are sometimes caught when manipulating belts of this description by hand. Mechanical devices save time because of the sureness of their action and because of the less need for the workman's attention to be completely diverted from his main duties while he shifts the belt.

STEPPING IN AND OUT OF SOME SHOP RESPONSIBILITIES

Tells of the understudying successors in shops waiting and working for the outworn shoes of the man higher up, and also has something to say of the assistance that comes from a lift given by the one further up at present on industrial ladder of success

SUPERINTENDENTS, foremen and all other employees may come and go. How far shall the outgoing man clear the way and make matters smooth for the newcomer? The question has been discussed in "Power," which also treats of the assistant waiting and working to fit himself to another's shoes. No better test of the caliber of man can be applied than to put him where he treats both understudies and successors according to his own free will.

Granted that there are many occasions where a responsible man has every provocation to quit his work without lifting a finger on behalf of the future welfare of an ungrateful or unreasonable employer, it none the less follows that the man who can rise above these sources of irritation and give the best that is in him to the plant to which he has devoted himself so long as he is in a position to help matters, shows himself far superior to the fellow who nurses a grudge. He definitely raises the tone of his calling by his coöperative spirit.

Treatment of understudies and nominated successors often calls for a large measure of tact and magnanimity, but there are so many practical ways of lending the helping hand to both classes of individuals that there is seldom much need of dwelling

upon the trying phases of the situation from the emotional standpoint.

When anyone realizes, either through his own choice or through circumstances, that a successor is slated for his position, and after he has made his own arrangements for taking up work elsewhere, there is often an interim before the change comes. Often the man who is going to leave has the opportunity to become acquainted with the chap who follows him. If an understudy is to take up the work, the opportunities for assisting the incoming man are sure to be numerous, unless through long assistance and apprenticeship the details of the plant are practically as familiar to one as to the other.

Whether the new man comes from outside or inside the organization, the retiring man of the right sort will throw open every detail of his knowledge of the physical plant in his charge to his successor; he will show him upon request, or after an appreciated suggestion, the purpose and special features of all parts of the equipment which might be difficult to handle or understand quickly; and he will share with the newcomer every proper record of operation which he himself would desire to have in taking charge.

He will throw open his notebook for his benefit and will permit blueprints to be made of tracings which he may have, besides explaining freely the manner of operation of any home-made labor-saving or other devices for enhancing economy of operation for which he may have been responsible.

He will share the results of tests and will post his successor, so far as the latter shows himself suitable *person to be* posted, upon the general po

of the organization regarding purchases and supplies, the treatment of officials, and the existing division of responsibilities among his subordinates. The wise will consistently avoid personalities, however, either in speaking of his superiors or of those under him, and thus will leave the incoming individual free from prejudices and in a position to form his own judgments of his associates.

If a man can make himself grant this sort of coöperation with an utter disregard of his own personal likes and dislikes in relation to those above and below him, he deserves to be classed among the thoroughbreds and listed as a master of his own personality, no less than of his highly technical and responsible profession.

R. R. Shuman has purchased the interest of Carl H. Booth in the Shuman-Booth Co. and has organized the Shuman Advertising Co., 620 Westminster building, Chicago, Ill., and will take a still larger part in trade and technical journal advertising as well as carry on a general advertising business.

New catalogue of the Crescent Machine Co., Leetonia, Ohio, shows among other useful machine woodworking equipment an addition to line of universal woodworkers. Machine consists of bandsaw, jointer, sawtable, borer and shaper. Machine may be bought without bandsaw and shaper. Attachments can be added for mortising, tenoning, making moldings, grinding tools, and sanding. New machine meets wants of those who do not need a complete oufit of individual tools, nor care to make the investment demanded by some of the other universal woodworkers made by this company.

PRODUCTION OF WHITE OR LIGHT COLORED PORES IN OAKS

PRESENT style of the many so-called Mission finishes calls for a light colored filler, especially in oaks; the wood having been first sponged, sanded and the pores opened with a picking brush. Effects produced by giving the fillers various shades ranging from absolute white through all the grays, greens and browns, are in many cases very pleasing to the eye. Gray oaks lend themselves well for this treatment.

These finishes are known under many names, but usually finished in wax. Best procedure is to use a strong water stain to give you the color deep enough so that when lighter filler is used, there will be some difference between the stained wood and the color of filler. Effect is to be striking and a good clean job will not permit the filler to be smeared over the wood.

Where an absolute white filler is desired, and where wax is to be the finish, it is well to give the work a very thin coat of shellac, and then mix carbonate of zinc (known to the trade as zinc white) with wax and rub it across the pores until they are thoroughly filled. Let this work stand for 24 hours, then apply second coat of wax and polish.

Where a gray filler is desired, continues a writer in "Brush and Pail," this same procedure can be followed merely coloring the white with dried drop-black.

Cores of black and Circassian walnut, the waste left after veneer cutting, are being used by a Pennsylvania company for making gun stocks.

THE HARDENING OF A BANDSAW BRAZE

Color considerations in a critical piece of work, and a method of treating the brazed joint to a toughening and tempering process when finishing the job

AFTER the two ends of a bandsaw have been brazed together the saw will be found to be soft at this place, notwithstanding that the greatest care has been taken with the operation. If the saw be left in this condition, it is very liable to bend and kink at braze, entailing considerable trouble to put right again. This trouble occurs even though the saw be very carefully handled when taking it off and putting it on machine, and when sharpening, rolling and setting it.

According to the most approved directions for brazing, the bandsaw should be taken out of the clamp as soon as the brazing irons lose their color and become black, and the saw should then be allowed to cool rapidly in the air. It is true that if this is done at exactly the right moment the saw at the braze will be much harder than if left in the clamp until nearly cold.

At the same time it is difficult, and very careful watching is necessary to judge precisely the right moment; and as there is no means of telling exactly how hot the irons are except by their color, there is an element of uncertainty about the process. On a bright, sunny day, when the light is very good, the irons will appear to be black much sooner than on a dark day when light is bad, and making allowance for this adds to risk of error.

Some men will further harden the saw by accelering the cooling process with a cold blast of air

produced by a pair of hand bellows; but there is a risk about this method, as the cooling may be local or uneven, causing the saw to be brittle in places, and the blast may be applied when the saw is too hot or too cold. The easiest and most certain method, it is further claimed, is to harden by a separate operation given in the "Timber Trades Journal" as follows:

After saw has cooled and the joint has been carefully filed and dressed down to the same thickness as the rest of the saw, place the saw on rollers over the leveling plate and anvil, with the joint lying flat between the two, and just clear of leveling plate. This should leave a few inches clear under the joint. Now take an iron (an old wornout brazing iron will answer very well) and heat it to a bright cherry red quite as hot as, or even a little hotter than, when brazing.

As soon as iron is hot enough, hold it under the joint—two or three inches below to start with, and gradually raising it until close to the saw, keeping it moving backward and forward all the time, so that the saw is warmed up evenly the full width.

As soon as the saw shows a dark straw color it is hot enough, and should be slipped along on to the cold leveling plate and a block of cold iron placed on top.

This requires to be done very smartly, so that saw loses as little as possible of the heat until it is suddenly cooled by the cold iron, when the job is done.

It will be noted that with this method the exact moment of taking the saw from the clamp is not of great importance, which, as the irons take some few

minutes to cool after brazing, is a convenience, as the workman need not stand watching all the time.

Should the leveling plate and anvil be too close together to allow of the iron being placed between them, the saw can be held up from the plate by two pieces of wood, or even held up by hand, while the heat is being applied to the saw by the iron.

If preferred, and gas is available, the heat can be applied by a gas jet, a length of tube with holes at intervals for the jets being used, attached to a piece of rubber pipe, with a tap for regulating the heat. In fact, some prefer this latter method as being less trouble and quite as effective.

THE DRIVING OF NAILS BY MACHINERY

N the April issue we had an account of a number of experiments made in the nailing of wood, especially of thin box-like lumber, by the use of machinery. We find, in response to several inquiries, that the inventor of this method of driving a nail where and how it will do the most good is A. S. King and the machine is made by J. Collis & Son, 43 Regent square, Gray's Inn Road, King's Cross, London, England.

"Handicraft in Wood and Metal" is a splendidly and profusely illustrated textbook, 240 6½ by 9½-inch pages, by John Hooper and A. J. Shirley, for teachers, students and craftsmen. It is an admirable collection of practical suggestions and data. Published by the Manual Arts Press, Peoria, Ill. Price, $3.

EFFICIENCY

is the watchword of every business today. The high cost of lumber and the strong competition in the wood-working field demand ***efficiency*** at every point.

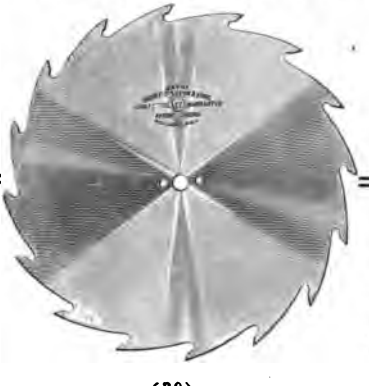
The finest work is turned out by the best saws. The saws themselves are kept at their highest point of efficiency by the use of high grade files. All these requirements are fulfilled in greatest measure by

DISSTON SAWS and FILES

HENRY DISSTON & SONS, Inc.

Keystone Saw, Tool, Steel & File Works

PHILADELPHIA, U. S. A.



BRANCH

Chicago
Boston
Cincinnati
New Orleans
Memphis
San Francisco
Seattle

HOUSES

Portland
Spokane
Sydney, Aus.
Vancouver

Canadian Works
Toronto, C

INCREASING BELT ADHESION ON IRON PULLEY

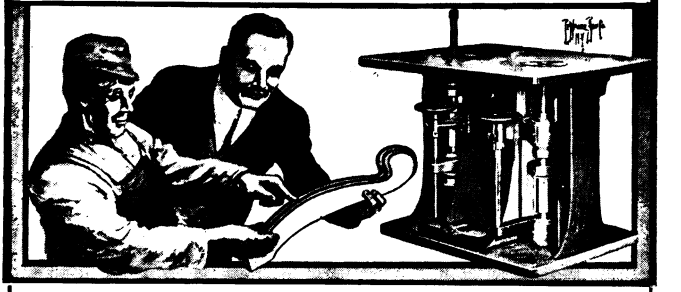
A SCHEME for fastening leather on to iron is given in the "Building World." It will come in useful to those who may want to try and improve the belt-pulling power of an iron pulley, though we have more than once on a very small pulley got a lot of help from winding onto it some of the adhesive tape used by electricians for taping wire joints, etc. This is the proposed plan: Give the iron a coat of lampblack and white-lead. When dry, add following mixture: Take best glue, put it in cold water until soft, then dissolve it in vinegar at a moderate heat, adding one-third white turpentine oil.

Fruit and vegetable packages have their staves cut almost entirely from shortleaf pine, black gum, yellow poplar and red gum, pine comprising nearly two-thirds of total; elm, birch and maple being used for hoops.

Opening of the Disston Athletic Association grounds on May 16 in Philadelphia was a lively function. First ball was flung by S. Horace Disston and then the Disston team trounced a star eleven of the Wissinoming Field Club by five to two.

Loose-leaf catalogue from the Phillips Mfg. Co., builder of window frame machinery, Orlando, Fla., contains several bulletins of patented specialties in sash pulley mortisers, pocket cutters, sawtables, saw guards, miter and dadoing machinery, etc. Picture and brief biography of the inventor, Francis V. Phillips, is included.

Finished In One Cut



To turn out variety edge shaping—something better than the ordinary—something which must be considered perfect work—the spindles on a shaping machine must travel at extreme high speed and never tremble or heat.

The spindles on a

Whitney Two Spindle Shaping Machine

move with lightning-like rapidity—at least 6000 revolutions a minute. This is not simply "claimed speed" but actual working speed without vibration or heating-up.

We go further than mere claims—for you want the facts about the true merits of a machine demonstrated before you buy.

For your benefit, we set forth the complete details of Whitney Shapers in a clear, concise way and furnish you with satisfying proof of performance.

To know the better shaper, write

BAXTER D. WHITNEY & SON

WINCHENDON, MASS.

California Office, Berkeley, California
North Pacific Coast Office, Stetson-Ross Mach. Wks., Seattle, Wash.

Selling Representatives

Chicago Machinery Exchange, 1219-27 Washington Blvd., Chicago, Ill.
Wysong & Miles Co., Greensboro, N. C., Agents for Virginia, North and South Carolina, Georgia, Florida and Eastern Tennessee

POWER DRIVES AND TRANSMISSION FOR WOODWORKING MACHINERY

Electrifying the plant and some savings it brings about in floor space and machinery location, selection of belts and their maintenance in best possible shape

MOTORS are the fashion nowadays, and there is undoubtedly a certain amount of fascination in the touch-the-button-and-the-figure-will-move notion, but many users of woodworking machinery are apt to "electrify" their shops or plant without due regard being paid to the circumstances governing their cases.

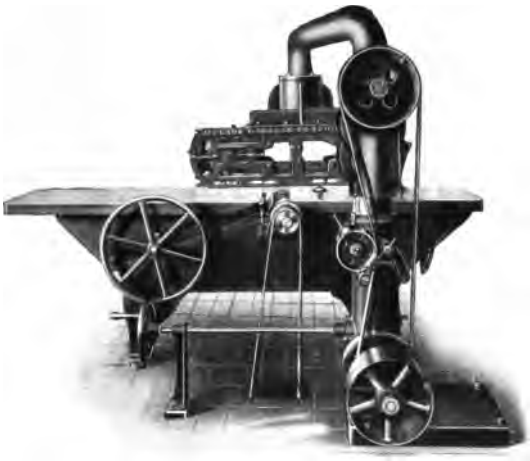
Floor space is, of course, an important factor, and in many instances the economy effected in this direction by the installation of a motor in preference to a gas engine is of great consequence.

Simplicity with which a motor can be started and stopped is a great convenience. Modern gas engines, however, require very little in the way of attention, and are started with little effort.

Makers of woodworking machinery have for some time past introduced ring-oiling and in some cases ball bearings, which are looked upon with great favor. It is seldom that the user will entertain the question of ring-oiling or roller bearings for his line shafting, and it is not generally realized that it is equally as advantageous to have dust-proof and friction-saving bearings for power in transit as well as in the machines, and this applies more particularly in the case of a woodworking shop where dust is always flying about than in any other. Extra cost thus involved is amply repaid in the long run.

THE HERZOG AUTOMATIC
Jointer Feeder

PERFECT SAFETY **MAXIMUM EFFICIENCY**



The type shown swings out to allow jointing and other miscellaneous work; we also make a large stationary feeder for surfacing only.

The Herzog Jointer Attachment does work of highest quality at from three to four times the speed of a hand operator.

Can be set to take out all, part, or none of the wind.

Handles equally well, stock long, short, wide, narrow, thick or thin.

Blocks as small as 3″ x 3″ are surfaced perfectly.

Eliminates all danger from what is otherwise the most dangerous machine in the factory.

Has scores of satisfied users in all lines of wood-working.

Once tried, always used; hence we will send it on thirty days' trial.

JACKSON & CHURCH CO. : Saginaw, Mich.

AGENTS

Chicago Machinery Exchange	Chicago, Ill.
Hermance Machine Company	Williamsport, Pa.
P. Pryibil Machine Company	New York City
William H. Field Company	Boston, Mass.

The general driving arrangement is a point requiring careful consideration. Bearing in mind the high speeds which obtain in the operation of this class of machinery, it is essential that the main line-shafts and countershafts be so arranged as to avoid unduly short drives, which latter, of course, shorten the lives of belts, consume more power than longer drives in consequence of the necessary tightening of belts, and increase the strain and wear on the machine bearings.

Majority of woodworking machines require to be run at such a speed as to render countershafts necessary. Best place for a countershaft is on the floor level. In the first place the shaper, which is of course one of the most useful machines in any shop, renders a horizontal drive (from countershaft to machine) absolutely necessary. Secondly, the most desirable drive in the case of all other machines is one in which there is a downward pull in an opposite direction to the feed, so as to throw the weight of the drive on the lower bearings of the machine. Therefore the best position for the line shafting is overhead, whence the power is transmitted to the various countershafts.

The selection of a suitable belt also requires careful consideration. What is required is a belt which is not affected by the heat which is developed as a result of the high speeds at which the machines are run, is sufficiently flexible to run round the small pulleys without slipping, and will not fray at the edges when running between grooved pulleys or forks.

Some belting is altogether unsuitable, as when subjected to heat the composition used for fastening

EXHIBITION!

FOR your convenience in purchasing and that you may see what you buy, compare different machines and satisfy yourselves regarding workmanship and quality, we are carrying a *permanent exhibition* of a complete line of woodworking machinery, new and rebuilt. We are representing all the better manufacturers in the United States. Our factory for manufacturing and rebuilding is on the same premises with the show room. We shall be glad to *show you.*

Planers
Jig Saws
Re Saws
Tenoners
Matchers
Moulders
Band Saws
Swing Saws
Boring Machines

P. Pryibil Machine Company

512-14-16-18-20-22-24 West 41st St.

NEW YORK, N. Y.

Sanders
Shapers
Supplies
Jointers
Circular Saws
Twist Machines
Self Feed Rip Saws
Wood Turning Lathes
Universal Woodworkers

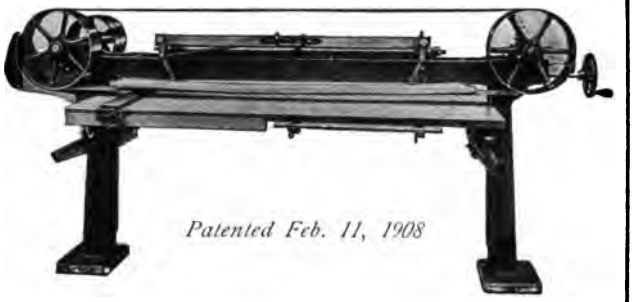
the plies together melts and before the belt has really seen satisfactory service these plies part company and belt is rendered useless. Woven belts are sometimes coarsely made and fray badly. Leather belting is fairly satisfactory, but is somewhat heavy for this class of drive, not being sufficiently flexible, and the heat materially reduces its life. Rawhide belting gives fairly good results, but the cost is high and in addition to trouble caused by stretching it is apt to become soft and pulpy, and shavings, chippings, etc., embody themselves in it. A most satisfactory belt is a very finely solid woven belt, which is all that could be desired. Flexibility, strength, absence of stretching and fraying make this type of belt most suitable for this class of drive.

In order to avoid slipping of belts a dressing is desirable, and the most convenient method is to use one which is supplied in the form of a brick, which is pressed on to the belt while the latter is running.—Above extracts are taken from a paper by W. H. Bilton in "Illustrated Carpenter and Builder."

Many a job is completely cooked by the management and the expense estimators, yet is served up raw to foreman. Put the office planning where it will best serve plant production.

A beautifully illustrated booklet in colors shows interior and exterior views of the palatial "Seeandbee," the most costly and largest steamer on the inland waters of the world. She will carry 5,000 passengers and 1,500 tons of freight and is operated by the Cleveland and Buffalo Transit Co. on Lake Erie.

Our Twentieth Century
BELT SANDER



PERFECTION IN ITSELF

Will do double the amount of work of a hand block machine and do it better and easier.

Complete Control ***Only One Lever***

enables the operator to sand his work at any point, as much or as little as he pleases, without changing his position.

OUR SPECIALTY IS

RUBBING AND POLISHING MACHINES
BELT SANDERS
DOUBLE MITRE SAWS

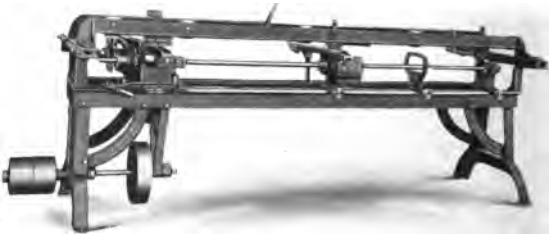
Write for circulars to

Maddox Machine Company

Jamestown, N. Y.

The Saw Table Has Had Its Day on Dadoing Window and Door Jambs

For it is not profitable to do your dadoing on a saw-table when *one man* with a "Phillips" Dado Machine can dado and trim **600 jambs per hour.**



Unequalled Results

are being obtained on this inexpensive machine

Frame is heavy and substantial.
Design is simple and practical.

A special Casing Trimmer Attachment will be furnished when desired. This Attachment trims outside window and door casings to length, one end beveled and the other square. Millmen tell us that it alone is worth the price of the machine.

Ask for complete details TODAY

The Phillips Manufacturing Co.

Orlando, Florida

There Is A Difference

IF someone tries to tell you that Garnet Paper is just Garnet paper —that there is no difference— just remember that there is garnet paper and

Carborundum Brand Garnet Paper

The difference is there because Carborundum Brand is uniform — it is coated with the cleanest, sharpest of Garnet grain the glue is of the highest grade — the process of manufacture the best. — Carborundum Brand Garnet Paper cuts faster — gives a better finish — lasts longer. *Let us send some sample sheets for trial.*

THE CARBORUNDUM COMPANY

Niagara Falls, N. Y.

Boston New York Chicago Philadelphia Cincinnati
Cleveland Grand Rapids London, Eng.

WHAT IS THIS?

A Systematizer of the glueroom, some call it. Others say it is a **Common Sense Drier** for Crossbanding and Veneer.

IT IS BOTH!

If we give it away? No, not quite, but we sell it to reputable manufacturers on a blanket guarantee to turn out flat and bone dry crossbanding and veneer quicker and better than is possible in any other way.

Of course, you can get along without. You have done so, your father and your grandfather, perhaps, but maybe it would pay for itself in 15 to 18 months and do away with all your troubles, if you have any in your glueroom.

Tear this out and mail it to

"MERIT," - Lockport, N. Y.

Made by the oldest concern
with the fullest guarantee
write for information
LORING COES & CO. INC.
WORCESTER MASS., U.S.A.

HOLMES No. 68½ SWING CUT-OFF SAWS

are so compact that you can put them anywhere in your shop.

Operates either right or left handed, with hand or foot lever control.

Table can be raised or lowered to handle any thickness of stock desired.

Is your shop handled to the best working advantage? A Holmes Cut-Off Saw in saving time and needless steps will pay for itself in one week's time.

Its simplicity makes it universally adaptable.

Write us for prices.

E. & B. HOLMES MACHINERY CO.

33 Chicago St. **BUFFALO, N. Y.**

WARNING!

Poor imitations of our Guide are on the market. Avoid any possibility of claim suits by sending us your orders direct.

PATENTED
Aug. 12, 1890
Feb. 10, 1891
Mar. 28, 1891
April 12, 1891
April 25, 1893

New Patent Issued March 4, 1913

We are in a position to furnish you these guides at the same price you can buy the imitation, ***and further, furnish you a guide which we can guarantee.***

Send us your orders direct for ***Guide Repairs.*** Duplicate parts always carried in stock.

The Charles E. Wright Co.

Sole Manufacturers **Kenilworth, N. J.**

(Mention Wood Craft in writing)

The KELLEY
Portable Electric Router

BY HAND **BY MACHINE**

Simplifies the most difficult hand work, and reduces tedious work of hours to that of minutes.

Try it for 30 days free on your stair routing, panel sinking, inlay and carving, column and pilaster fluting, cabinet and furniture work.

If you can do without it at the end of that time, and fail to see where it has paid for itself, send it back.

Order one today on this trial basis.

15 CUTS **15 CUTS**

Kelley Electric Machine Company

1407-1409-1411 West Ave.

Buffalo, N. Y.

R. L. Scrutten & Co., Ltd.
161 Clarence St., Sidney
Agents for Australia

Henry Kelley & Co.
26 Pall Mall, Manchester, E. C.
Agents for Great Britain

Start a Business of Your Own

The "OBER" LINE of HANDLE MACHINERY will help you

LATHES, SANDERS, RIP SAWS, CUT-OFF **SAWS**, BOLTING SAWS, ETC., for getting **out** HANDLES of various kinds, WHIFFLE-TREES, NECK YOKES, SPOKES, BALL BATS, SPINDLES AND VARIETY WORK.

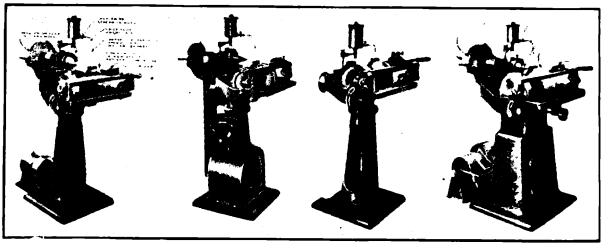
OBER MACHINES are MODERATE IN COST, EASY to OPERATE, STRONG and DURABLE.

Write for free information and Catalogue No. 23

THE OBER MFG. CO. **Chagrin Falls, O., U.S.A.**

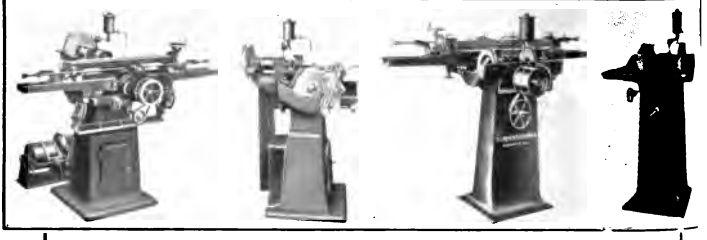
Mummert-Dixon Oilstone Grinders

ARE MADE IN SIZES TO MEET THE REQUIREMENTS OF EVERY TYPE OF WOODWORKING SHOP



DISTRIBUTED BY

Oliver Machinery Co.	Grand Rapids, Mich.
American Wood Working Machine Co.	Rochester, N. Y.
Baird Machinery Co.	Pittsburgh, Pa.
Kemp Machinery Co.	Baltimore, Md.
Syracuse Supply Co.	Syracuse, N. Y.
C. C. Wormer Machine Co.	Detroit, Mich.
General Machinery Co.	Spokane, Wash.
Vandyck-Churchill Co.	Philadelphia, Pa.
Hendrie-Bolthoff Mfg. & Supply Co.	Denver, Colo.
Eby Machinery Co.	San Francisco, Calif.
H. B. Mehring & Co.	York, Pa.
E. L. Essley Mach Co.	Chicago, Ill.



MANUFACTURED BY

MUMMERT-DIXON CO.

HANOVER, PA.

Oliver Machinery Co., Manchester, Eng. - Sole Agents for Great Britain

The COLBURN Universal Saw Table

is a machine in which the distinguishing features are

SPEED
CONVENIENCE
ACCURACY

Our complete catalog is yours for the asking — drop us a line

Colburn Machine Tool Co.

Franklin, Pa.

TO get the maximum capacity from your Continuous Feed Jointer, you should fit it with the Genuine Morris Wood & Sons 20th Century Solid Steel Guaranteed Glue Joint Cutters.

These cutters will be furnished on your new Jointer if you insist upon it. *Our Guarantee:* Better cutters have never been produced. Our thirty-eight years of cutter-making reputation back this guarantee. Can you beat it? Better get a line on our prices.

Write now for Circular W. C.
It tells all about them.

MORRIS WOOD & SONS

5108-5110 W. Lake St. CHICAGO, ILL.

Do You Make A Fair Profit?

THE AVERAGE LIFE of a manufacturing concern is fifteen years. Nearly 5000 went under last year. None of them knew their factory costs. 97% of all manufacturers do not know accurate costs. That's one of the big reasons why so many fail.

Do You Know Your Costs?

A DENHAM COST SYSTEM will give you absolute costs without expense or red tape. It is not a cut-and-dried system of forms but a service by expert investigating engineers who analyze factory conditions and build a system for each individual plant.

That's why Denham Cost Service has placed systems in 500 factories in over 80 cities. Denham customers say the system is indispensable in their business and pays dividends several times each year.

May we tell you how to make more profit in the furniture business?

¶ *"Science of Costfinding" sent free upon request.*

The Denham Costfinding Co.

Illuminating Bldg.

Cleveland

NOTICE

We would like to have all the progressive

Superintendents and Foremen

of all classes of woodworking plants receive

WOOD CRAFT

IN order to have it mailed to you free it will be necessary for you to fill out the blanks below and mail to

Wood Craft

Caxton Bldg. - - - Cleveland, O.

Name .....

Street Address.....

City and State.....

Position I hold.....

Name of firm where I work .....

THE COAST LINE TO

MACKINAC

DETROIT, CLEVELAND, BUFFALO, NIAGARA FALLS.

TOLEDO, PT. HURON, ALPENA, ST. IGNACE.

"THE LAKES ARE CALLING YOU"

ARRANGE your vacation or business trip to include our palatial lake steamers. Every detail that counts for your convenience and comfort has been provided.

Daily service between Detroit and Cleveland, and Detroit and Buffalo. Day trips between Detroit and Cleveland during July and August. Four trips weekly from Toledo and Detroit to Mackinac Island and way ports. Special Steamer Cleveland to Mackinac Island two trips weekly June 25th to September 10th, making no stops enroute except at Detroit every trip. Daily service between Toledo and Put-in-Bay June 10th to September 10th.

Railroad tickets accepted for transportation on D. & C. Line steamers in either direction between Detroit and Buffalo or Detroit and Cleveland.

Send two-cent stamp for illustrated pamphlet giving detailed description of various trips. Address L. G. Lewis, General Passenger Agent, Detroit, Mich.

Detroit & Cleveland Navigation Company

Philip H. McMillan, *President.*
A. A. Schantz, *Vice Pres. and Genl. Mgr.*

Fare $3.00

—DAILY BETWEEN—

Cleveland and Buffal

THE GREAT SHIP "SEEANDBE

Length 500 feet; breadth 98 feet, 6 inches: 510 staterooms and commodating 1500 passengers. Greater in cost—larger in all —richer in all appointments—than any steamer on inland wa world. In service June 15th.

Magnificent Steamers "SEEANDBEE," "City of Erie" and "City of E

Daily—CLEVELAND and BUFFALO—May 1st to

Leave Cleveland -	8:00 P. M.	Leave Buffalo -	8:0
Arrive Buffalo - -	6:30 A. M.	Arrive Cleveland	6:3

(Central Standard Time)

Connections at Buffalo for Niagara Falls and all Eastern and Points. Railroad tickets reading between Cleveland and Buffa for transportation on our steamers. Ask your ticket agent for C. & B. Line. Write us for handsome illustrated booklet free.

THE CLEVELAND & BUFFALO TRANSIT CO., C

The Expert Wood Finisher

A Complete Manual of the Art and Practice of Finishing Woods by Staining, Filling, Varnishing, Waxing, Etc.

By A. ASHMUN KELLY

339 Pages *6 x 5½ inches*

CONTENTS

Description of Woods Used in Wood Finishing.
Fillers for Filling Woods.
Finishing the Woods.
Filling and Fuming Oak.
Piano Finishing.
Finishing Veneer Work.
French Polishing.
Stains and Staining.
Various Stains for Various Woods.
Formulas for Staining Woods.
Shellac Varnish.
Flatting Varnish.
Examination and Testing of Varnish.
Varnish Troubles Explained.
Varnish and Varnishing.
Finishing Hardwood Floors.
Furniture Finishing.
Doing Up Old Furniture.
How to Treat Stains, White Spots, Etc., on Furniture.
General Information. A Glossary.

Price $3.00

Cabinet Making

By J. H. RUDD

If you are a worker in wood, whether in the factory or in the school-room, you will be interested.

A book written for the practical cabinet maker, in a practical way. Cabinet Making is not a treatise for beginners, but it will prove as adaptable to the student in the manual training class-room as to the factory worker. Its terse, free style is unburdened with technicalities and offers solutions of your own problems that you can apply in your own way.

Price $1.50

Wood-Turning

Uses of Wood-Working Machines and Pattern-Making

By GEO. H. RESIDES *and* HUGO DIRMER, M. E.

160 pages, 10 x 7, 169 illustrations

Wood-working and pattern-making are more fully treated in this book.

(1) The book is thorough.

(2) It gives a complete series of motion study pictures of wood-turning and wood-working, so that the reader can attain the best results with the minimum of risk and time.

(3) It describes the standard types of wood-working machinery and their uses.

(4) It furnishes a set of detailed working drawings of the sort that emanate from a well-organized drafting-room.

Price $1.50

"Glue Handling" 1

A Manual for the Practical Glue Worker

By FRIMAN KAHRS

Pocket Edition of 180 pages. Blank pages for writing. Flexible binding, two pockets in cover for clippings, etc.

CONTENTS OF CHAPTER 1

1. Knowledge and System Applied to Glue Handling 19-29
Preparatory Work up to 1898.
Work Done Since 1898.
Recent Editorial Comment.
Ancient Methods and Modern Machinery.
The Glue Testing Problem Now Solved.
Glue Testing Figures Must Show Practical Working Capacity.
What the Glue Specialists Should Know.
Men Needed as Glue Specialists.

Price $1.00

Sent anywhere, postpaid, for the price

WOOD CRAFT BOOK DEPT. CLEVELAND, O.

Do you know what this emblem stands for?

IT means bigger, better, cleaner business. It is the inspiring insignia of 140 clubs, with a membership of over 10,000 earnest men. Learn what the Associated Advertising Clubs of America are doing for honesty in business, for more systematic, scientific and successful methods of distribution, advertising and salesmanship. Attend the Tenth Annual Convention of the A. A. C. of A.

TORONTO—June 21-25, 1914

Interesting Program

The program for this great convention is comprehensive and diversified, covering every phase of modern merchandising. The sessions will be addressed by able, successful men. Open meetings, devoted to a wide range of special topics, will give everybody a chance to ask questions and hear his own problems discussed by the men who have met and solved them.

Edward Mott Woolley

the famous writer on business topics, has made a study of the A. A. C. of A. and their work, as well as of the plans for the Toronto Convention. He has embodied the result in a little book "The Story of Toronto." This book paints a graphic, inspiring picture of what this great movement signifies.

It will be sent free to all business men asking for it on their business stationery—together with detailed facts as to the convention program and rates for accommodations

Address **CONVENTION BUREAU**

Associated Advertising Clubs of America

Toronto, Canada

"THERMO" ELECTRIC GLUE HEATER

NEAT—CONVENIENT—ECONOMICAL—DURABLE

Small sizes have glue pot and jackets of copper and are fitted with Disc Type of Heating Unit unless otherwise ordered.

Different types of electric heating units used in our Glue Pots, Heaters, and Spreaders, as required or desired, and pots and jackets constructed of different materials as desired.

State capacity and voltage required

CHAS. E. FRANCIS CO. : : Rushville, Ind.

THE WEATHERLY INDIVIDUAL Glue Heater

Send your address and receive descriptive circular of Glue Heaters, Glue Cookers and Hot Boxes with prices.

The Weatherly Co.

Grand Rapids, - Mich.

Extensively used by the Grand Rapids furniture workers.

The Days For Taking Chances Are Past

when you can protect your employees without impeding their work.

The Porter Quick Adjusting Shaper Guard or Hold Down

is the last word in positive protection against injury from carelessness. To prove it just order a sample guard today.

C. O. PORTER MACHINERY CO.

660 Front Avenue **GRAND RAPIDS, MICH.**

Loose Pulleys That Earn Money

Sent on trial at our risk.

Wilmarth & Morman
(Nelson Patent)

Your first investment is your last investment when you buy from us.

Actual experience of over 12 years has demonstrated that they will run without being touched, except occasionally for oiling.

Stop trying to repair your old pulleys and put in the kind that never need repair.

Wilmarth & Morman Co. 1182 Monroe Ave., N. W. Grand Rapids, Mich.

Acetone
Amyl Acetate
Benzole
King Turpentine
Oil Soluble Colors
Water Soluble Colors
Spirit Soluble Colors

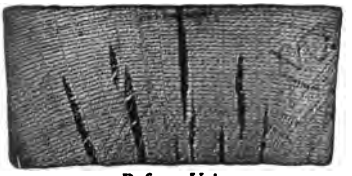
Creosote Oil
Acids Commercial and Chemically Pure
Cyanide Potash
Bichromate Potash
Polishing Waxes
Cement Sticks
Orange Shellac

And other Chemicals for Technical and Pharmaceutical purposes.

Write for quotation and ask for our Stain Booklet brimful of useful information for the foreman finisher

WALTER K. SCHMIDT COMPANY

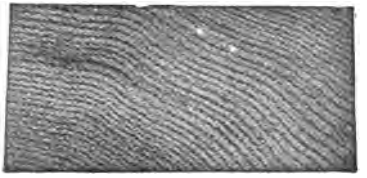
306-308 Monroe Ave. - - GRAND RAPIDS, MICH.



Before Using

OUR METHOD DRIES LUMBER AS NEVER DONE BEFORE

After Using



For Real Results

—IN—

LUMBER DRYING

it will pay you to write

GRAND RAPIDS VENEER WORKS

SOLE MFRS.

GRAND RAPIDS, MICH.

English Representative
Oliver Machinery Co., Manchester

THE ALLINGTON & CURTIS MFG. CO.

Manufacturers of

Slow Speed
Low Power
SHAVINGS & DUST COLLECTING SYSTEMS

You Can Save Power
by having us install one of these systems for you

CHICAGO **SAGINAW, MICH.** **SO. BOSTON**

WE employ the most efficient testing methods obtainable, and when our glues have passed through that department they are graded exactly according to their quality, for the specific use they are intended, and each sheet is stamped according to its grade, assuring ABSOLUTE UNIFORMITY at all times.

Why bother with glues that are graded in a haphazard manner and are not stamped?

You don't have to test each shipment of COIGNET FRENCH GLUES.

Try some of our grades, advise us which you like the best, and leave the rest to us; each sheet will show the quality you get.

At your service for prices and samples

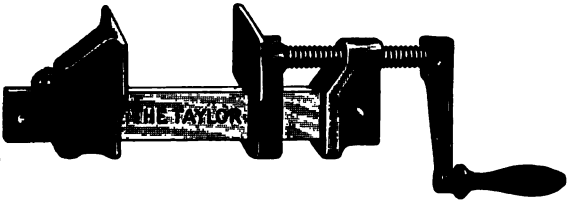
COIGNET & COMPANY

17 STATE STREET - - NEW YORK CITY

FACTORIES AT ST. DENIS, LYONS, FRANCE

"How Do You Like Taylor Clamps?"

was asked a German workman who had been using our clamps continually in the glue department of the H. Herrmann Lumber Co., New York City. He smiled and gave a satisfied grunt as he looked at the clamps. "Kvick" he said. They suited him, for he was on piece work.



If you pay your workmen by the day, the clamps will suit *you* just the same as they do this workman. Such is the experience of The U. S. Navy Yards, The Pennsylvania R. R., The New York Central R. R., The Singer Sewing Machine Co., General Electric Co., etc., etc.

Send for one of our free booklets showing our clamps, and a large list of firms using them.

James L. Taylor Mfg. Co. : Poughkeepsie, N. Y.

THE LONG BROAD JAW OF THE UNIVERSAL CLAMP

makes it particularly adapted for all kinds of veneering and paneling work.

Our catalog No. 252 will give you complete description, sizes, and further information as to its time saving and quick acting features.

Send for your copy today

BATAVIA CLAMP CO.

165 Center Street **Batavia, N. Y., U.S.A.**

"ANDREWS"

TRANSFER CARS

Cross or End Piling

Are of better, heavier design, stronger construction, more effectively cross-braced, and run easier than any other good Transfer Car offered.

For details and prices—
Address DRIER DEPARTMENT

The A. H. Andrews Co.

115-117 S. Wabash Ave. CHICAGO

This is Something You Want!

IT will prevent you from making financial losses, also assist you in securing new customers.

THE RED BOOK

is published semi-annually in February and August.

It contains a carefully prepared list of the buyers of lumber in car lots, both among the dealers and manufacturers.

The book indicates their financial standing and manner of meeting obligations. Covers the UNITED STATES, ALBERTA, MANITOBA and SASKATCHEWAN.

The trade recognizes this book as the authority on the lines it covers.

A well organized Collection Department is also operated and the same is open to you.

Write for Terms.

Lumbermen's Credit Association

ESTABLISHED 1876

608 So. Dearborn St. CHICAGO — MENTION THIS PAPER — 116 Nassau St. NEW YORK CITY

No. 9

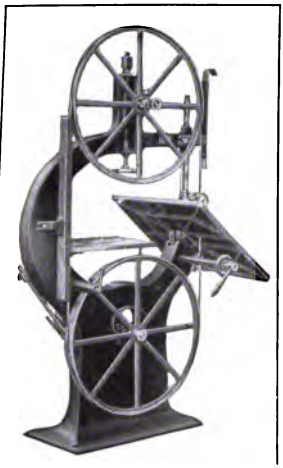
Automatic
Self Feed

CUT-OFF SAW or SLASHER

WRITE today, mentioning that you have seen the new **CUT-OFF SAW** in "Wood Craft," and we will send you by return mail our new folder, showing its new features for handling doors, sashes, blinds, furniture, boxes, car material, etc., etc.

Fischer Machine Works

1841-45 Carroll Ave. **CHICAGO, ILL.**



Saw Tables, Jointers, Swing Saws, Band Saws

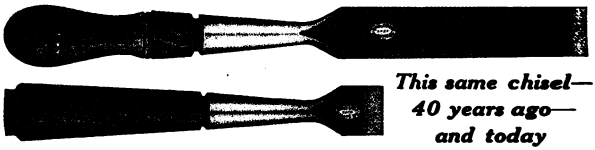
SILVER'S New Woodworking Machines are newest, most improved tools on the market. In rigidity, in ease and convenience of operation, in moderate price, they beat all others to a frazzle.

Jointers—8, 12, 16, 20 and 24-inch.
Band Saws—20, 26, 32 and 36-inch.
Swing Saws—6½, 7, 7½ and 8-foot.

Send for Machinery Catalog No. 60

THE SILVER MFG. CO.

345 Broadway, Salem, Ohio



This same chisel—
40 years ago—
and today

It Took 40 Years to Wear Down This Chisel

and it is giving as satisfactory service today as when first bought.

BARTON EDGE TOOLS

are made even better today than they were 40 years ago.

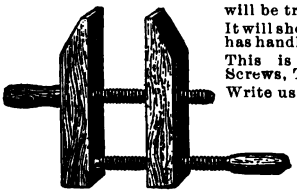
Specify them. If your hardware dealer should be unable to supply you, send to us for a catalog and our free Story Book entitled "True Stories." It is worth your reading.

MACK & COMPANY

Brown's Race near Platt St. ***ROCHESTER, N. Y.***

The work that passes over a

CHRISTIANSEN BENCH



will be true, well handled and easily turned out. It will show the pride of the workman, because he has handled it under perfect working conditions. This is equally true of Christiansen Hand Screws, Tool Chests, and our entire line. Write us for our quality catalog and prices.

C. CHRISTIANSEN
2225 Grand Ave.
CHICAGO - - ILL.

THE
escent Universal Woodworker

is just the machine for the carpenter, contractor and lumber yard.

It will do your band saw cutting, shaping, saw table cutting, boring, make mouldings, mortising and tenoning, panel raising, rabbeting, grinding and sanding.

It will save you in time, space and investment. Better than any other one or five machines you can secure.

To decide this question, all you need to do is to look over our booklet carefully. **Send for a copy today.**

The Crescent Machine Co.
22 Columbia St., Leetonia, O.

The Best Groover or Dado Heads in America are
COCKER'S

Sizes $\frac{1}{8}$" to 2" or more in width.

YOU will also find the Cocker Shingle, heading, concave, resaws and chisel-tooth saws to be the best on the market. We make knives of every description. They are fully guaranteed.

Write us for prices and complete description

THE COCKER MFG. COMPANY

larket Street : Lockport, N. Y.

Quality Printing

is composed of the ***Ability*** *to do good work, with the* ***Proper Facilities*** *to handle such work economically and quickly from a production standpoint. To this may be added*

Printing Judgment

The ability to add that touch of the artistic which gives individuality and divides your literature as effective rather than common. But to these there is still another step:

Gardner Service

We are able to make application of outside ideas to your needs through having come in contact with the successful selling ideas and experience of a hundred different lines.

The Gardner Printing Company

CAXTON BUILDING **CLEVELAND, OHIO**

The MEETING PLACE of Employer & Employee

Advertisements under this heading FIVE CENTS PER WORD. Copy must be received not later than the 20th of the month preceding date of issue. If you do not find what you require, let us help you.

WANTED—EXPERIENCED FIRST-CLASS ESTIMATOR and practical foreman on interior trim and cabinet work, understanding plans and details with good previous record. Apply The Markert Mfg. Co., Syracuse, N. Y.

SUPERINTENDENT WANTED FOR UP-TO-DATE pedestal extension plant. One capable of taking full charge from yard to finishing room. Must understand cost system. Right party may have interest in firm. State salary, experience and reference in first letter. Address Box 300, care Wood Craft, Cleveland, Ohio.

POSITION WANTED AS SUPERINTENDENT OR MANager of a furniture factory. Have had fourteen years' experience as superintendent and manager of a large furniture company in Ohio. Desire change on account of company going out of business, having sold the entire plant for other purposes, and am now open for a position and desire to get in touch with a good concern. Would prefer the table business, but am capable of handling men, understand machinery, cabinet and finishing, also buying material. Can give the best of reference. Further particulars on request. Address Box 304, care Wood Craft, Cleveland, O.

WANTED—EXPERIENCED MAN TO PIECE-BILL, DEtail and take measurements for sash, doors, and interior finish. Write, giving experience, time could come and wages expected. The Toledo Lumber & Mill-work Co., Toledo, O.

WANTED—STRICTLY UP-TO-DATE FURNITURE SPEcialties man as general foreman; must invest at least $2,500. Also machine men and cabinet makers who must invest at least $500 each. All investments absolutely secured. For further information address Pacific Furniture Specialties Mfg. Co., Inc., 418-419 Lumber Exchange Bldg., Portland, Oregon.

WANTED—MILLWRIGHT FOR WOODWORKING FACTORY employing 800 men. Location Wisconsin. Address Box 303, care Wood Craft, Cleveland, Ohio.

WILBUR R. SMITH

Industrial Engineering

Woodworking plants, box factories a specialty

609 E. 17th St., Alton, Ill.

MANUFACTURING IN CANADA

American manufacturers, contemplating the establishment of a factory in Canada, will save time by consulting us. We have complete detailed information on every commercial city, shipping facilities, power rates, raw materials, labor conditions, details of vacant factories, inducements, etc.

Dep't F, Heaton's Agency. **Toronto, Ontario, Canada.**

GERLACH

Circular, Band and Cylinder Saws

New Roller Saw Swage and Sharpeners

Are unexcelled in Europe or America. We use the best steel, the finest equipment, and have sixty years behind us.

The Peter Gerlach Company. **Cleveland, Sixth City.**

FREE SITE FOR BOX FACTORY

Liberal inducements to right parties. Water front. Right in the center of box wood territory. Write to

James H. McDonald,

Secy. Land & Power Co. **Rapid River, Mich.**

42-INCH THREE-DRUM SANDER

A1 running condition; just been practically all overhauled by factory. Will exchange for lumber at a reasonable figure. Address

Marquard Sash & Door Mfg. Co.

7 Canal Rd., cor. W. 3d St. **Cleveland, Ohio**

MACHINERY SECTION

Lists of Second-hand Machinery, for Sale or Wanted, will be published in this department at the rate of 35 CENTS A LINE each issue (nine words to the line). Name and address are not counted in the space charged for. Copy must be received not later than the 20th of the month preceding date of issue.

REBUILT, TESTED AND GUARANTEED SECOND-HAND MACHINERY

28- and 32-in. single surfacers.
24-in. hand planer.
Double spindle shaper.
Heavy double end tenoner.
8-in. 4-side molder.
36-in. band saw.
Swing cut-off saw.
30-, 42- and 48-in. three-drum sanders.
Large mitering machine.
61-in. double glue spreader.
9 x 38- and 13 x 50-in. sectional veneer presses.
Lot of factory trucks, all sizes.

Mail us a list of your wants.

The John T. Towsley Mfg. Co.
Builders of Modern Woodworking Machinery, Gluing Appliances, Factory and Lumber Trucks.
1100 Evans St.
Cincinnati, O.

FOR SALE

Lath mill and bolter combined, Frisby, nearly new, $100.
Mortiser, No. 3 Smith, $100.
Moulder, 6-in., 1-side, Smith, $70.
Moulder, 6-in., 2-side, Smith, $75.
Moulder, 6-in., 4-side, Houstan, nearly new, $250.
Moulder, 7-in., 4-side, Powers, nearly new, $225.
Moulder, 9-in., 4-side, Houstan, $300.
Moulder, 12-in., 4-side, Woods' inside, $250.
Planer and matcher, 9 x 6 in., $425.
Planer and matcher, 24 x 6 in., Fay, heavy, $400.
Resaw, band, American, 48-in. wheel, $600.
Resaw, circular, 42-in., $200.
Sawmill, band, 63-in. wheel, carriage 18 ft., $750.
Shaper, Indiana, 2-spindle, $110.
Surfacer, 26-in. Whitney single, with sectional feed rolls, $400.
Tenoner, Houstan, double head and 2 copes, $175.
Tenoner, Hall & Brown, double head, 2 copes and cut-off saw, $140.

Badger-Packard Machinery Co.
74-76 W. Water St. **Milwaukee, W**

WOODWORKING MACHINES

Hand jointer, 24 in.....$ 70
Boults carver, shaper and dovetailer with reverse friction drive 85
Sander, two 24-in. drums and 48-in. iron disk, good as new 85
Sander, two vertical spindles..... 25
Saw, double cut-off, 6-ft..... 50
Tenoner, single 40
Water grinder 15
Planer, 24-in. Towsley, good as new..... 125

The C. F. Streit Mfg. Co. **Cincinnati, Ohio.**

WILLIAM H. SNYDER

General Sales Agent

Rotary cut gum box shooks, etc.
Dimension oak and hickory lumber.
Three-ply panels, door stock, crossbanding, drawer bottoms, etc.

Submit your specifications for prices.

838 Jefferson Ave. **Indianapolis, Ind.**

FOR SALE

Mattison Turning Machine

Hermance mortising, Berlin 30-in. cabinet planer, International 12 H. P. gasoline engine.

W. A. Reineke. **Perry, Ill.**

FOR SALE

Two No. 131 Mattison belt sanders. These machines are practically new, having been in operation only three months. For further particulars address

Ragland-Baxter-Morford Co. **Nashville, Tenn.**

A GOOD PROPOSITION

Complete woodworking plant just built and equipped, up-to-date in every respect; suitable for any furniture manufacturer or woodenware specialty or vehicle bodies. Sawmill adjacent for special cut stock. Low power rate, good railroad facilities. Will lease on cash or percentage basis with privilege of purchase. A good proposition to the man with cash for operating expenses. Address

Commercial Association. **Crawfordsville, Indiana.**

CUT PRICES

In Modern Woodworking Machines

Band saw stretcher, Covel 8-in., $45.
Band resaw, Cordesman No. 3½, 42-in., used 6 months, good as new, 6 blades, only $350.
Bed clamp, Benedict, $50.
Blower, Sturtevant 25-in. for sawdust, $20.
Borer, Dennis horizontal with slide spindle, $50.
Box matcher with press, Chase, No. 227, pwr. fd., used 3 months, $175.
Combination saw, Burlington, $35.
Cut-off saw, Hamilton Auto Railway, No. 97, $75.
Cut-off saw, Beach, No. 3, box and furniture makers, double, good as new, $100.
Door clamp, Hall & Brown, 8 x 4, good as new, $85.
Engine, high speed Jewel Auto, 38 H. P., $100.
Exhaust fan for shavings, Sturtevant 35-in., $25.
Floorer, Fay & Egan No. 38, 14 x 6 in., 6-roll, fine order, $350.
Glue heater, Francis No. 10, $5.
Lathe, Hoyt wagon axle, automatic, $100.
Lathe, Ober Broomhandle, auto, $50.
Lathe, Klotz, nearly new, spoke and handle, $100.
Lathe, Merritt table leg and baluster auto, $125.
Lock corner box machine, used 6 months, $275.
Mortiser, New Britain chain saw with 6 chains, good as new, $200.
Moulder, Colloday, 10-in. 4-side, $250.
Moulder, modern Hamilton, No. 28, 9-in. 4-side, rebuilt, $175.
Moulder, Smith 8-in. 4-side, rebuilt, $100.
Panel raiser, Smith upright hand feed, $45.
Planer and matcher, Ball 24-in., heavy single, $75.
Planer and matcher, Fay & Egan No. 38, 14 x 6 in., 6-roll, 4-side, $350.
Planer, Frank, 20 x 6, No. 101, double planer, modern, fine order, $150.
Planer, Superior 24 x 6 Pony Sgl., $75; Frank 20 x 6 Pony Dbl., $100.
Planer and matcher, G. & W. 26 x 6 4-side, $250.
Resaw, Fay No. 4, combined band, scroll and resaw, 42 in., rebuilt, $175.
Resaw, Goodell & Waters, 24-in. circular, rebuilt, $75.
Resaw, Smith, 36-in., 4-roll, $125.
Ripsaw, Williamsport, self feed, rebuilt, $75.
Sander, Cordesman-Meyer, 24-in., iron frame, hand feed, $50.
Sander, H. D., feed, with 2 drums on one shaft, $25.
Sander, Columbia, 36-in., 3-drum, $450.
Saw gummer, Rogers Automatic circular, $25.
Scroll saw, Fay, iron table, $25.
Shaper, Egan single spindle with reverse counter, $65.
Shaper, Hall & Brown No. 2 double spindle, $50.
Siding resaw, McNish & Butler, 24-in., $50.
Tenoner, Fay double head and double cope, rebuilt, $100.
Woodworker, B. & M. 8-in. Universal and Combined 8-in. 4-side moulder, $200.
Woodworker, Fay 8-in. Universal, rebuilt, $110.
Woodworker, Fay & Egan, No. 77 Variety, with hollow chisel mortise attachment, used 3 months, $125.
Window frame machine, Smith & Phillips Perfect, $175.

This is only a partial list. We have just bought a furniture factory and planing mill. Machines not listed yet. Let us know what you want. We have it and at very low price.

Woodward Machinery Co. **514 Main St., Cincinnati,**

FOR SALE

Used Woodworking Machinery

Band saw, West Side Iron Works, 36 in.
Borers, 2 Andrew single-spindle, vertical.
Borer, M. L. Andrew 30-in. vertical, 4-spindle.
Borer, Bentel & Margedant, 2-spindle, hor. 1 to 6 in.
Dovetailers, Dodds', 9-, 12- and 24-spindle.
Edger, Fay & Egan, wood frame 10 ft.
Grinders, knife, B. T. & B. 44-in., Rogers 44-in.
Jointers, Buss 8-in., G. & K. 16-in., Cordesman 24-in.
Jointer, B. & M. 30-in. with power feed.
Moulders, 6-, 7-, 8-, 10- and 12-in. outside.
Planers, Clement 20-in. and 26-in., B. & M. 24-in.
Planers, single cabinet, Buss 30-in., 2 Dennis 30-in.
Planers, 2 American No. 4½, 24-in. single.
Sander, H. B. Smith 30-in., hand feed.
Sander, Mattison, No. 111 belt.
Saws, tilting table, 2 American No. 1, Egan & Co.
Saw, heavy rip, Fay & Egan, for 30-in saw.
Saw, Rowley & Hermance combination saw and dado.
Shapers, double spindle, Indiana, Buss.
Tenoners, J. A. Fay & Co., W. R. & R. wood frame.
Window frame machine, Smith & Phillips No. 3.

Ask for complete stock list No. 14.

The Chas. A. Strelinger Co.

Woodworking Dept. **96-110 Bates St., Detroit, Mich.**

FOR SALE

Woodworking Machinery

Band resaw, 42", $225.
Blower fan, Fay, $15.
Box matcher, Egan, $100.
Door clamp, Fay, $85.
Mortiser, Houston, $35.
Moulder, 5", 3-side, $60.
Moulder, 8", 4-side, $125.
Planer, 24 x 6", Fay, $75.
Planer and matcher, 3 S., $200.
Ripsaw, self feed, $110.
Sander, 3d, 36", Berlin, $325.
Sander, 3d, 42", Columbia, $450.
Scroll saw, Beach, $20.
Tenoner roller table, $100.
Veneer presses, 12 x 42", $20 each.
Band resaw, 50", $300.
Double fan, 40", $35.
Railway saw, $35.
Blind clamp, $20.
Mortiser, R. & P. table, $65.
Moulder, 6", 4-side, $100.
Moulder, 10", 4-side, $225.
Planer cabinet, 26", $175.
Planer and matcher, 4 S., $250.
Greenlee S. F. Saw, $135.
Sander, 3d, 36", Columbia, $425.
Sander, Smith slat feed.
Shaper, double, Frank, $40.
Tenoner, double end, $175.
Woodworker and moulder, $200.

Woodworking Machinery Company.

P. O. Box 157. **Newport, Ky.**

BARGAINS EXTRAORDINARY

WOODWORKING

1 10-in. 4-side molder, Colloday.
1 36-in. automatic knife grinder.
1 16-in. hand jointer, Goodell & Waters.
1 Alber stair router.
1 30 x 6 J. A. Fay & Co. double surfacer, divided feed rolls, cabinet type, A-1 condition, $300.
1 30 x 8 Money Maker double surfacer, weighing about 10,000 lbs., A-1 condition, $400.
1 15-in. 4-side inside matcher, J. A. Fay & Co. make, fine condition, $250.
1 7-in. 4-side Holmes Atlantic inside matcher in fine condition, $200.
1 15 x 6 J. A. Fay & Co. inside matcher in fine condition, $250.
1 15 x 6 J. A. Fay & Co. inside matcher in fine condition, $350.
1 24 x 6 planer and matcher, 4-side.
1 2-saw edger, 24-in., in fine condition, $50.
5-Cabinet single surfacer.
2 Tenoning machines.
2 Double cut-off saws.

SPECIAL BARGAINS IN SANDERS

1 42-in. 3-drum Perfection sander, thoroughly overhauled, $350.
1 48-in. 3-drum Thomas sander, $400.
1 48-in. 3-drum H. B. Smith sander, $500.
1 54-in. 3-drum J. A. Fay & Co., fine order, $500.
1 48-in. 3-drum Royal Invincible sander, $550.
1 60-in. 3-drum Columbia sander, in A-1 condition, $600.

JOINTERS

1 18-in. Crescent hand jointer.
1 16-in. Goodell & Waters hand jointer.
1 18-in. Crescent hand jointer, in A-1 condition, $90.
1 30-in. Buss extra heavy hand jointer, $125.

Woodworking machinery of all kinds.
Write, stating your requirements.

CLEVELAND BELTING & MACHINERY CO.

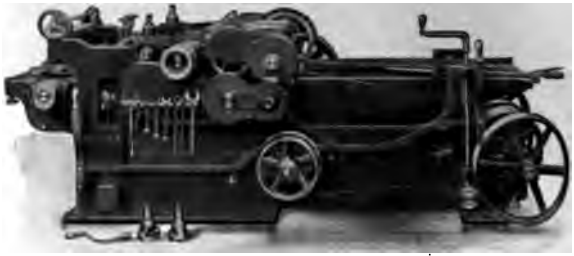
1922 Scranton Road, Cleveland, Ohio

ESTABLISHED
1847

INCORPORATED
1878

Woodworking Machinery

Front Side View of



No. 14-A Planer and Matcher

A **combined** machine that will surface 24″ x 6″ and match 14″ x 4″ and will plane **two** boards at a time.

Send for Circulars

H. B. SMITH MACHINE CO.

SMITHVILLE, N. J., U. S. A.

New York Chicago Atlanta San Francisco

THE SUCCESS SECRET *of the* CLARAGE FAN

Lies in

The Wonderful Life which its Bearings Give.

No Fan is better than its bearings.

Every Clarage Bearing is provided with two brass oil rings which carry the oil freely from the reservoir to the sleeves supporting the shafts.

The outer case completely encloses the sleeves, and forms an oil reservoir of unusual capacity. The felt washers at the outer ends of the case fit close around the shaft, thus preventing the oil from working out or being pulled out by the suction of the fan. They also prevent dust and dirt from getting in.

The design and placing of the inner sleeves is another success essential in Clarage Bearings.

You can secure Clarage fans—engine or pulley driven—Clarage Heater Coils for Hot Blast Factory Heating Installations, Blower Dry Kilns, and Exhausters of every kind.

Complete information in reference to them will be given freely on request. Ask for our new catalog W-C-3.

CLARAGE FOUNDRY & MFG. CO.
HEATING, VENTILATING AND DRYING ENGINEERS
KALAMAZOO, MICH.

EASTERN BRANCH—149 BROADWAY, NEW YORK, N. Y.

The Chain Saw Mortiser

is the most adaptable machine on the market.

Every adjustment is within the instant reach of the operator.

And it's an easy machine to operate, which makes it a popular machine in the shop.

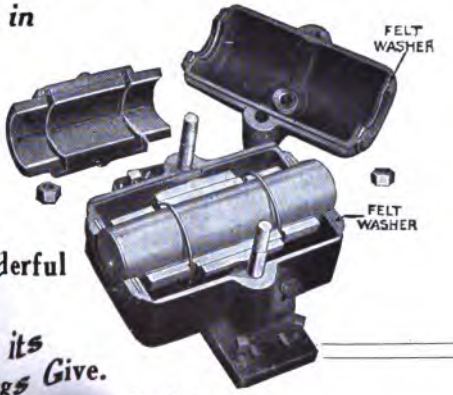
It will pay you to investigate the Chain Saw Mortiser

The New Britain Machine Co.

16 Chestnut St. **NEW BRITAIN, CONN.**

THE SUCCESS SECRET *of the* CLARAGE FAN

Lies in



The Wonderful Life which its Bearings Give.

No Fan is better than its bearings.

...ing is provided with two brass oil rings ...eely from the reservoir to the sleeves

...etely encloses the sleeves, and forms ...sual capacity. The felt washers at ...ase fit close around the shaft, thus ...m working out or being pulled out ... fan. They also prevent dust and

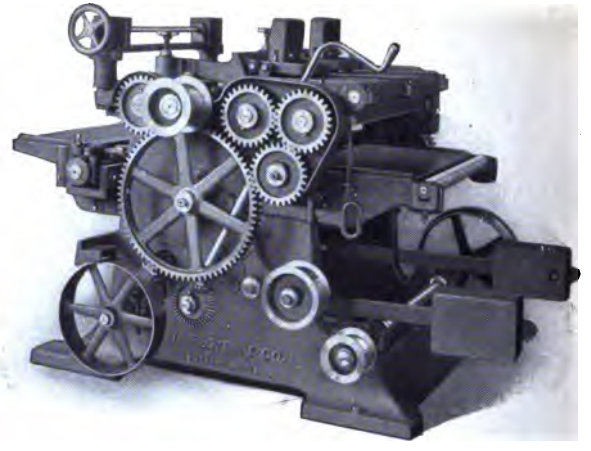
...g of the inner ... another suc- ...age Bearing

...y driven— ...ating Instal- ... every kind.

... will be given ... W-C-3.

...RY & MFG. CO.
...ND DRYING ENGINEERS
...ZOO, MICH.

...DWAY, NEW YORK, N. Y.



FOR EITHER SINGLE OR DOUBLE SURFACING

Power's No. 14 Surfacer

has been designed with our very latest ideas incorporated in it.

It is an unusually well built yet medium weight Surfacer, and produces absolutely uniform and fast work.

Our new folder describing this machine will be mailed on request. Send today for a copy of it.

Wm. H. Field Co.
Boston, Mass.

Olney & Warrin
New York

L. Power & Co.
6 South 23rd Street
Philadelphia, Pa.

Eby Machinery Co.
San Francisco, Cal.

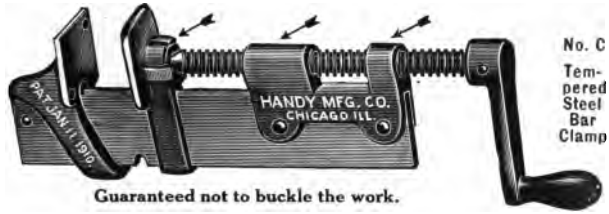
Zimmerman-Wells-Brown Co.
Portland, Oregon

We make Band Saw Blades of Imported Steel
They Last Longer

Handy Clamps are Better

No. F

Screw is 2 inches above Tempered Steel Bar,



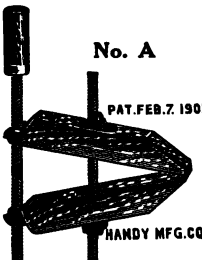
No. C

Tempered Steel Bar Clamp

Guaranteed not to buckle the work.

Tempered Indestructible Steel Bar Clamps. Screw works in two bearings, increasing the life of the clamp over 100 per cent.

"Handy" Patented Steel Spindles and Steel Nuts on "Hand Screws" guaranteed not to break.



No. A

Can be kept rigid or attached in any position.

Strongest Hand Screw Made

Works nearly ***twice as fast*** as common wood screws. Spindles have a right and left hand thread. Gives a tighter grip and less power required. Glue cannot stick to spindles. Handles guaranteed not to get loose. Jaws are best seasoned maple.

Try our "Mitre" Clamp also our "Frame" Clamp.

....ORDER SAMPLES....

Send for Catalogue and Prices of Full Line of Clamps

HANDY MFG. CO.

27 E. Madison St. CHICAGO

This Kelley Electric Routin Machine

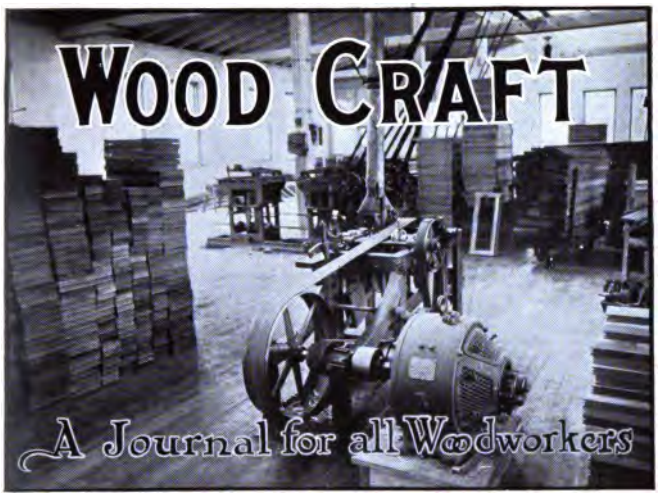
will be sent you for a 30 day FREE trial on your Sta Routing, Panel Sinking, Inlay and Carving Column an Pilaster Fluting, Cabinet and Furniture Work. Just write t

Kelley Electric Machine Compan

1407-1409-1411 West Ave.
Buffalo, N. Y.

R. L. Scrutten & Co., Ltd.
161 Clarence St., Sidney
Agents for Australia

Henry Kelley & Co.
26 Pall Mall, Manchester, E. C.
Agents for Great Britain



Published by
THE GARDNER PRINTING COMPANY
CAXTON BUILDING - CLEVELAND, OHIO

VOL. XXI JULY 1914 No. 4

WRINKLES FOR WOODWORKERS

A fine workman has a long memory for his blunders.

Naturally we expect the smooth proposition to slip up.

Getting ahead in the shop is reversed by back talk to foreman.

Safety is in a due combination of information and self-restraint.

Some folks make rules when they cannot make others or themselves measure up to them.

The heavier the hand trucks the more it pays to have overhanging frames outside of wheels.

GLUING PAPER TO THE GRINDER DISK

Old and new ways for the woodworker of putting the sandpaper on the disk smoothly and securely

E had trouble in keeping the sandpaper smooth and tight round the outside of our 24-inch steel disk-grinder. After using two different liquids and several cans of silicate of soda without satisfactory results, I dropped into another shop, and asked their way of doing it, and, after trying it myself, I have had no more trouble.

The plan as described by J. A. McEwan in the "American Machinist" is as follows: Wet the sandpaper disk all over the back so that it will swell. Warm the steel disk round the outside (I held a stick against each side of it when in motion, and heated it in this way, as it was difficult to remove the disk from the machine), and, while warm, apply a good coat of yellow shellac all around the outside, about 2 inches wide (do not cover the whole surface); then take the sandpaper, which by this time should be limp and soft, and spread it evenly over the disk.

Clamp on a wooden ring to hold it tightly against the shellacked part of the disk until it dries, which will be in from two to four hours, according to the atmosphere.

To remove the sandpaper when worn smooth, tear off all the center part, and use a round-point turning-tool to clean off the shellac and paper round the outside.

By following this method, the paper is always tight and smooth, no matter what the weather is like, because it has been shrunk on, and the outer edge does not loosen since shellac is not affected v dampness.

MACHINE-ROOM REMINDERS AND PRECAUTIONS

Certain practical rules for foremen adopted in the hope of reducing the number and severity of accidents

T one plant a series of rules for safety were drawn up as a guide to the foremen in making the necessary reports on existing conditions and as a guide to alterations for the better. In brief they were about as follows:

All new transmission devices should be arranged for being easily guarded. Shield old ones as well as the new.

Where there is danger of being caught by belt, have a pipe or angle railing 18 inches from pulley or belt.

Provide wire-mesh or perforated-plate casing wherever belt is such that any one may be caught between belt and pulley.

Inclose that place where the flying ends of a broken belt may strike passersby.

Allow the width of a belt between any two pulleys or between pulley and a hanger on shafting where the belt might wedge and perhaps pull down shafting.

Make belt splices without any ragged edges or other projections to catch employees' clothes. Endless belts preferred.

Inspect belts frequently. Keep them safe. Don't have them tight.

Use a mechanical device in shifting all belts.

Have belt held away from shafting by hook or *perch whenever belt* is unshipped.

Cover shafting not over 12 inches above floor, and incase or rail off shafting over 12 inches and not over 7 feet above floor.

Incase or otherwise guard exposed ends of shafting.

On overhead shafting requiring oiling try to provide permanent footing for oiler.

Install a safety switch for electrically driven shafting to be used when any one is working on it. Put switch at top of ladder or anywhere not easily tempting the meddler or the misinformed.

Guard shaft couplings where safety style is not used.

Have shaft ends project at least the diameter of shaft beyond hub of gear or pulley so that key can be locked and gears or pulleys prevented from working off.

Note that shaft hangers must be strong and well secured.

Cut off or guard all projecting keys so exposed on shafting that any one might be caught by them.

Adopt cotter pins or spring washers or check nuts to keep bolts where they belong.

Bonnet the projecting setscrew, or bury it by countersinking, or put it into a collar having flanges high enough to shield the nuisance.

Beware of hoisting by use of the shafting. Employ hand tackle and block, or other hoisting facilities.

Johnson says the real character of a man is found in his amusements; no man is a hypocrite in his pleasures.

SOME SPECIMENS OF WOOD-TURNING

Comparisons of old and new workmanship at lathe

FIGURES 1 and 2 are direct reproductions from carefully measured drawings of some pine balusters in the museum at South Kensington and are of the Georgian period. These fine spindles are of various dates from the late seventeenth century and into the early eight-

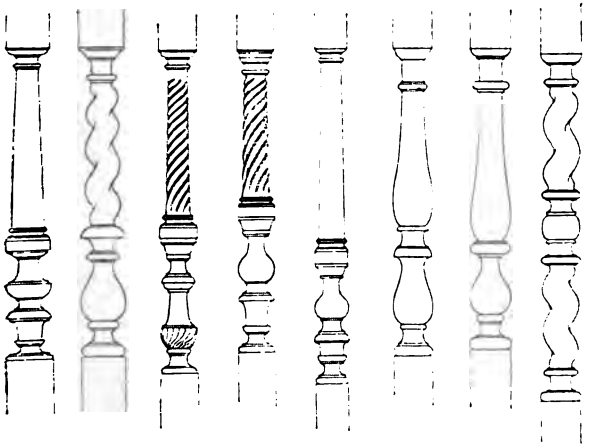


Fig. 1. Some Examples of Georgian Lathe Work

eenth century, and they well illustrate the skillful scope of the workmen of that time in the design and production of these graceful specimens. These drawings were in the first place made accurately full size and then reduced by photography to pre*serve their correct* proportions.

Fig. 3 illustrates a very instructive comparison, as

these were turned pieces exhibited at the Turners' Exhibition recently held in London, England, at the Mansion House by John Grant, Longcauseway, Perth.

Figs. 1 and 2 are reproduced here from the drawings by J. Vivian Bennett in the "Illustrated Carpenter and Builder," and Fig. 3 is from the "Cabinet Maker."

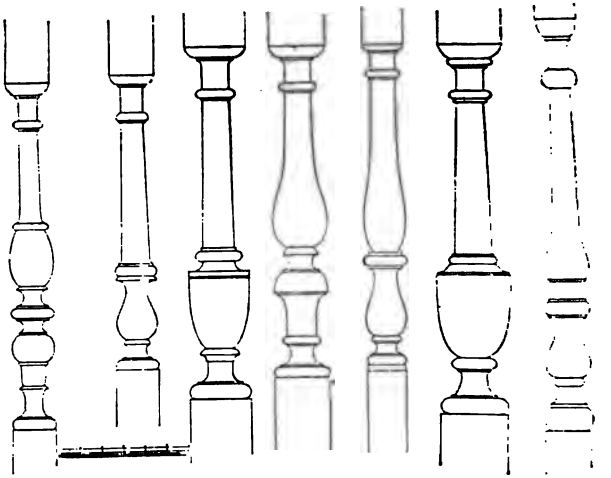


Fig. 2. Further Examples of Georgian Lathe Work

American Consul A. E. Ingram at Bradford, England, writes that wooden wheelbarrows from U. S. are well liked over there as to price, material and K.D. shipping. Only one kink has arisen and that is in the peculiar hollowing of the handles required to fit foreign fists. Mr. Ingram will cheerfully mail an old handle of English pattern to any manufacturer.

Strength and durability of wood is shown by its density, as represented by the proportion of summer wood to spring wood in the annual growth rings. Growth rings of pine are of bands of hard dark resinous summer wood, and sharply contrasting lighter, softer and less resinous spring wood, in each

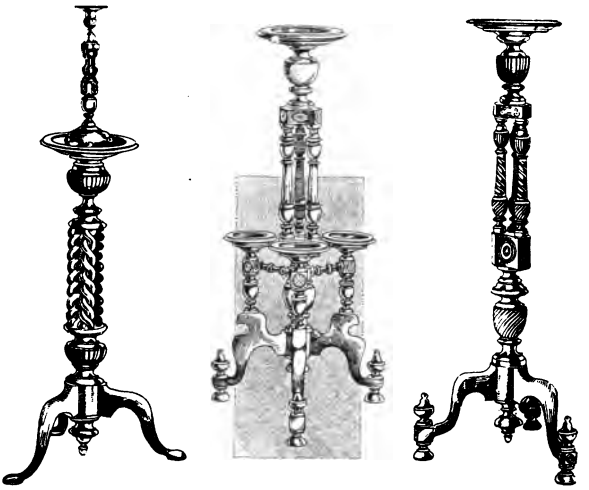


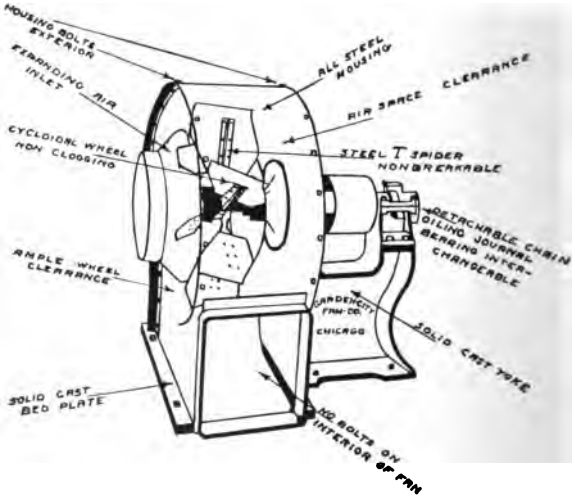
Fig. 3. Recent Examples of Lathe Work

growth ring. The greater the proportion of summer wood the greater the strength and durability of stock.

This war of substitutes for wood got a peculiar twist in the construction of a new library building at Springfield, Mass., where sawdust was mixed with concrete in order to produce a material in which nails could be driven and where they would hold when driven into place. After some little experiment the right mixture was obtained.

CYCLOIDAL SLOW SPEED POWER-SAVING SHAVINGS EXHAUSTER

THE average old-fashioned fan has been an extravagant power consumer every minute the plant was in operation. After thirty-five years' active experience in manufacture of shavings exhausters, fans and blowers, there has been perfected the "Cycloidal" slow speed



Features of the Cycloidal Fan

power-saving fan. Material passing through fan does not come with direct impact on blades but passes through at angle, reducing friction and shock, and adding to durability of wheel. This also precludes possibility of fan clogging, as there is ample clearance behind wheel, next housing. Journal earings on these shavings exhausters are latest

improved detachable automatic chain oiling, with large oil reservoirs, and lined with special babbitt metal, and hot boxes are unknown. Maker thoroughly tests with an endurance run every fan for running balance and perfect bearings before it leaves factory. This fan is manufactured only by the Garden City Fan Co., Chicago, Ill.

What doth it profit a plant to have plenty of trucks and to pay no heed to means and a system for keeping every truck load where it belongs on its truck while it goes full speed direct to destination.

Somebody's job should keep track of the counterweights on mortisers, borers and the like machines. An eye regularly to a cotter pin is as good an investment in safety oversight as to see that the cutter screws are either flush or guarded or that the belts have shields fronting them.

"Practical Exhaust and Blow Piping" is a capital treatise on the planning and installation of fan piping, discusses problems in blower work, etc. There are 159 5½ by 8-inch pages of valuable pointers. Only book of its kind known to us. Price, $2. Published by the Sheet Metal Publication Co., Tribune building, New York, N. Y.

Another safety suggestion is that any dangerous parts of machines should be so indicated in red letters. Of course the idea is to remind and thus help men to be careful, to be cautious being the main thing in the prevention of accidents. However, prudence is one thing and timidity is another. A warning is all right but a scare can lead to trouble. Carefulness and competence give confidence.

CURIOUS POINTERS ON THE STRENGTH OF WOOD

Tests which illustrate the peculiar properties of woods and show especially the cause of their great ability to recover after the endurance of heavy loads

ROM a series of tests on wood made at the Mechanical Engineering Department of the Northampton Polytechnic Institute, Clerkenwell, London, England, on American and other materials, we find that the most reliable test is by crushing short blocks in the direction of the grain. Crushing at right angles or across the grain is not so satisfactory. Strength along the grain is much greater than the strength cross.

Some specimens were soaked in water for one to three weeks. This decreased the resistance in all cases to compression but affected certain woods more than others.

After one week's soaking, birch had but 57 per cent of the strength when dry. After two weeks' soaking it had but 53 per cent of the dry crushing strength.

When soaked for a week, elm and teak were superior to the other woods tested. After two weeks' soaking, elm has greater over teak although it also decreases in value. Elm and teak were thus shown very serviceable for use in water.

Quite a useful proportion was found in figuring the relation of the crushing strengths of the various woods to the weight in pounds per cubic foot. An approximation was 165. Use of this factor is suggested that knowing the weight of a wood in pounds per cubic foot we can then by multiplying by 165

find the approximate crushing strength in pounds per square inch.

Failure of the wood specimens in the testing machine showed that when a piece had failed, many of the fibers still possessed much elasticity. On releasing the load in machine there was sometimes as much as a recovery or spring of one inch where the compression had been about two inches. Pointer of the testing machine would rise and fall slightly as pressure was applied, indicating that the specimen would hold the load for a short period and then compress slightly, repeating this until failure.

Woods	Average Stress	Comparative Strength
Mahogany	7430	1.50
Teak	7420	1.50
Yellow deal	6960	1.4
Ash	6330	1.28
American whitewood	5880	1.18
Birch	5800	1.17
Beech	5470	1.10
Elm	5300	1.07
American oak	5050	1.02
Pitch pine	4960	1.00

Average Stresses in Pounds per Square Inch on Woods and Their Comparative Strength

The table shows the average stresses in pounds per square inch of the various woods under test and their comparative strength, the weakest wood being taken as unity.

From the Cocker Mfg. Co., Lockport, N. Y., we have received a new catalogue of saws and machine knives of all sizes, abrasive wheels and dressers, etc. Several tables of useful information add considerably to the worth of the work.

MAHOGANY AS A CABINET WOOD

MAHOGANY, most beautiful and noblest wood, has its use unlimited due to its esthetic and technical qualities. While many cabinet woods change appearance to their own disadvantage, mahogany with time takes on a mellow color which is universally praised. Mahogany coming into trade in large sizes can be used for interior finishing, wainscoting, and similar work. Chippendale and Sheraton long ago recognized the value of this wood and used it almost exclusively for masterpieces. It does not warp and is easily worked.

Mahogany was imported into Europe shortly after the discovery of America and is taken from the tropical forests of the West Indies and Central America. Jamaica, Honduras, Domingo and Cuba furnish fine timber. About twenty years ago, "African" mahogany was brought into market, differing, however, from real mahogany. Gabun, Benito and Cape Lopez mahoganies are superior kinds and have beautiful silky surface. Of darker brown color, seamed with lighter streaks, is the Sapeli mahogany, coming from Africa. African mahogany is preferred abroad, as it is cheap and comes in larger dimensions. Most African types are of rough grain, less dense and solid, than the American.

Elasticity of modern saws is instructively proven by the tests respectively given by a couple of mechanics who told of a Disston hand saw having the point pushed through the hole in handle. After of these men had passed saw point four inches igh handle and after a while it was released, ade again sprang into shape "as straight as a "

TEACHERS ARE TAUGHT TREE VALUES

EIGHT thousand schoolteachers will receive general instruction in forest conservation at the July meeting of the American Forestry Association at Chautauqua, N. Y. They will be told how forest fires now cause an annual loss of 70 lives and $25,000,000.00; and this instruction will be emphasized by moving pictures of fires and methods of fighting them. They will also be told, and shown by "movies," how lumber is made. Tree history from seed to forest will be described with pictures by Dr. B. E. Fernow, of the University of Toronto, and E. T. Allen will describe the close relation between the forests, timber, and the people. Charles Lathrop Pack, a director of the Association, and former president of the National Conservation Congress, will make an address on forest conservation, and Prof. J. S. Toumey, director of the Yale Forest School, will discuss the teaching of forestry in the public schools. J. E. Rhodes, Chicago, in telling how lumber is made, will deal with the problems of the lumbermen. Capt. J. B. White, Kansas City, will speak on the lumbermen's attitude toward forest conservation, and Dr. Henry Sturgis Drinker, president of the Association and president of Lehigh University, will tell of what the Association is doing in educating the people to properly value trees.

Luck is often but outlook added to look out.

Palace of Machinery at the Panama-Pacific International Exposition at San Francisco has an area of 369,600 square feet. Nine of the eleven principal exhibit buildings are now completed and the others were to be finished early in July.

MAKING PANELS AND VENEERS

Various methods employed in Europe and comparison with American practice, and possibilities of developing our veneer and panel trade with England

FROM a paper by J. B. B. Stryker there may be taken some very instructive comparisons of veneer and panel making methods. Much of the foreign product showed up remarkably well under his inspection and therefore the methods employed become of technical importance to us.

Cutting of veneer and the manufacture of panels, tops, etc., in Europe, dates back much farther, but the United States leads in number of plants in operation, amount of output and general magnitude of business. In France veneering has been done for hundreds of years, but in a very small way. Where veneered lumber was desired, the cabinetmaker would cut his own veneer; the product obtained should be more properly called thin lumber. The log placed with each end on a high saw-horse, and the veneer sawed off, one man under the log and one above, pulling the saw up and down. This method may yet be seen in remote localities of Europe.

There are veneer and panel plants in almost all countries of Europe, Russia leading in number of plants operated and amount of production, followed by France, Germany, Austria-Hungary and England in order named. Italy, Belgium and other smaller countries do something, but little is done in ›ain. Russia ships to other countries of Europe, ge quantities going to France and to England icularly.

›lant on the United States seaboard might be

DISSTON

The Saw the Millman Looks Up to

IT is the saw he depends upon if he wants to keep quantity and quality of output up and his manufacturing expenses down.

The high regard in which he holds this saw is a development from the years of efficient service which Disston Saws have been giving.

This appreciation of Disston Saws is not confined to any one country—wherever mills are converting timber into commercial lumber, there you will find Disston Band and Circular Saws.

Our new book, "Saw Appreciation," tells why you should use Disston Inserted Tooth Saws. Free for the asking.

HENRY DISSTON & SONS

Incorporated

Keystone Saw, Tool, Steel and File Works

PHILADELPHIA

able to do a considerable amount of business in England. All timber products consumed in England must be imported, there being no native timber supply. In Liverpool I saw immense stocks of mahogany logs carried by dealers. For six or eight blocks along the river front mahogany logs were piled to a height of 20 or 30 feet. These logs were auctioned off piecemeal to the highest bidder.

European manufacturers prepare logs as we do, boiling or steaming them. Cutting of veneer is same, as is the drying. In Austria-Hungary and Germany the alder is largely used for core stock.

Five-ply work is laid up as here, but in Vienna, which in Austria is the home of fine furniture, I saw Circassian and mahogany tops laid up three ply, the veneers being laid on 3/4 or 7/8-inch alder cores, sometimes with grain and sometimes across grain. American manufacturer usually considers this high-class work can be done only by cross-banding. Preparation of the veneer and the building up into panels, tops, etc., in white, was no better, but finish put on work in many cases excels. Deep finish they obtain is very pleasing.

Beech is used largely in France for panels, as it is cheap there. Today 3/8-inch veneered panels are in demand there, where they have before been using thin, solid lumber because of latter splitting.

In London is a panel factory having not a single power-driven machine—a law prohibiting its use in the district. In making panels they place center ck on floor and glue is applied by hand with large sh. This plant had several presses worked by a pump, and the glue was kept in condition by g bucket over gas flame. Method of handling

WHAT IS THIS?

A Systematizer of the glueroom, some call it. Others say it is a **Common Sense Drier** for Crossbanding and Veneer.

IT IS BOTH!

If we give it away? No, not quite, but we sell it to reputable manufacturers on a blanket guarantee to turn out flat and bone dry crossbanding and veneer quicker and better than is possible in any other way.

Of course, you can get along without. You have done so, your father and your grandfather, perhaps, but maybe it would pay for itself in 15 to 18 months and do away with all your troubles, if you have any in your glueroom.

Tear this out and mail it to

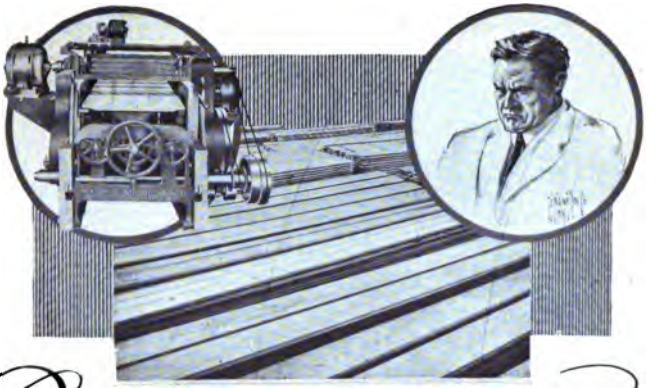
"MERIT," - Lockport, N. Y.

resulted in much blistered work, which was repaired by placing wet cloth over blistered portion and then running hot flatiron over wet cloth until veneer stuck down.

In Germany I saw a veneer clipper with knife coming down very slowly on an angle of less than 45 degrees. This machine clips ends off a whole flitch of sliced veneers at once, and so clean that ends can be spliced into perfect joint. It is used for cutting veneers to proper length and width, and also for jointing veneers ready to splice. Splicing is done by young girls tacking edges of veneer to a board and then sticking a strip of gauze tape over joint.

On tops turned out by concern crossbanding and back veneers are nearly all 1-24-inch poplar, with a very small proportion of sliced oak veneers not good enough for face stock. Face veneers are sliced 1-28-inch black walnut and plain sliced 1-28-inch oak.

All five-ply work is glued in two operations; core is first veneered with crossbanding, and when this comes out of bales in which it sets over night, it is put on sticks and left to dry out for six days. It is then taken to the sander, where about one-half of crossbanding is sanded off, leaving banding about 1-48 inch thick when face and back veneer are put on. When this is finished it is left on sticks another six days before face and back veneers are sanded. Reason for gluing up five-ply stock in two operations, and giving it 12 days' drying, was that, as erators wished to lay up veneer slightly damp on ory that it would lie flat and cause less trouble slicing, there would be less likelihood of the fin work drying out and checking afterwards.



A Whitney is the Answer

To Every Planing Problem

No matter what kind of lumber you plane, seven widths of Single Surfacers and seven widths of Double Surfacers enable you to select the particular sized Whitney Planer best suited to your requirements.

And it can be either Belt Driven or Direct Motor Driven, without belts.

You obtain in a Whitney Planer all that superior skill, experience and highly-specialized ability can give toward the production of a planing machine that you can depend upon—as no other—to produce greatest volume and smoothest planing at lowest possible cost.

Tell us what kind of surfacing you do—we will make suggestions as to the means of equipping your Whitney Planer especially for your work with square cylinders carrying two or four knives or round cylinders and four thin high speed steel knives, sectional rolls and steel sectional chip breakers or flexible steel chip breakers, and jointing, grinding and setting devices.

——*WRITE*——

BAXTER D. WHITNEY & SON

WINCHENDON, MASS.

California Office, Berkeley, California
North Pacific Coast Office, Stetson-Ross Mach. Wks., Seattle, Wash.

Selling Representatives

Chicago Machinery Exchange, 1219-27 Washington Blvd., Chicago, Ill.
Wysong & Miles Co., Greensboro, N. C., Agents for Virginia
North and South Carolina, Georgia, Florida and Eastern Tennessee

LOCATION AND LAYOUT OF A BOX FACTORY

Making the most of a site, getting the stock by mechanical means into plant, handling the sawdust and shavings, kindling as a side line to a box factory, and the several mechanical means employed

PROFITS from a box factory depend much upon arrangement of buildings, the means for handling material from its raw form to finished product, and the disposal of waste. An efficient plant arrangement for a box factory has been worked out where the space was of irregular shape and limited.

Owners made use of a triangular piece of property, bordered on two sides by streets, with the hypotenuse running along the railroad. Plan drawn by Lockwood, Greene & Co., Boston, Mass., and adopted by the company in question, consisted in erecting brick and timber buildings, the receiving building being located adjacent to railroad with three conveyers leading from it to main shop.

Arrangement has effected the simplest movement of material from receiving building on railroad line through main shop and out to teams which make the major portion of delivery. Raw material is transported from receiving buildings to main shop by three roller-type conveyers, delivering material directly into feedrolls of heavy planers on top floor of main mill.

Cut-off machines, feeders, trimmers, and matchers all make much sawdust as well as end clippings. Under each machine is a hopper for this waste material and delivering it to a conveyer on ceiling of story below. These conveyers deliver to a comma

CARBORUNDUM BRAND GARNET PRODUCTS

Carborundum Brand Garnet Paper sanding table-tops in the largest table factory in the world

THE better the output of a wood-working plant, the more efficient the sanding equipment, the more certain it is that they are using Carborundum Brand Garnet Paper and Cloth, whether it is the Carborundum Brand Paper, or Cloth, in sheets, rolls, or belts, they have the same clean, quick-cutting qualities—the long life. Every inch is uniformly coated with the hardest, sharpest, of Garnet grain—the grading always runs uniform, and the paper, cloth, and glue must stand the most convincing tests of quality.

Samples for trial whenever you write.

THE CARBORUNDUM COMPANY

WORKS:

NIAGARA FALLS, N. Y., U. S. A.

REISHOLZ DÜSSELDORF MANCHESTER, ENG.

Stores:

New York Chicago Boston Philadelphia
Cleveland Cincinnati London, Eng.

conveyer running at right angles. Latter feeds a hopper having screen of such mesh that sawdust drops through, while end clippings pass over screen and on to another conveyer leading outside of main building and delivering end clippings into upper part of shaving bin in boilerhouse. This material is then shoveled by hand from bottom of bin hopper into boiler for fuel.

For handling sawdust there is a blower system carrying material to roof of main building, where it is delivered to a bin.

There is a second and independent blower system for collecting shavings. There are connections from heavy planers to fan whence two pipes lead to shaving bin on top floor of kindling building and to a collector on top of boilerhouse, respectively. From the latter five discharge pipes lead, one to shaving-bin and one to each of four boilers. At point where delivery pipe from fan branches to go to either boilerhouse or shaving-bin, a switch and percentage valve are located. This permits boiler tender to keep an even air pressure on fire beneath boilers. Switch operates directly from boiler-room floor.

A fourth system is in use for handling kindling wood. Strips are collected from trimmers in boxes and wheeled to kindling saws which are near end of main mill opposite kindling building. These saws cut the wood into proper lengths for kindling, the pieces dropping into hoppers under machines and then on to inclined conveyer delivering to a horizontal conveyer overhead in first story. Latter ps onto a belt conveyer delivering the kindling a large bin at top of kindling wood building, bin is of sufficient height so carts may be

On What Basis do You Buy Planer Knives?

If it is quality, you will be interested in knowing that the **"Coes" Planer Knives** rank A-1 in this respect.

Our meaning of quality is just this:—

The best material obtainable—uniformity of dimensions — uniformity of temper — special process—ground to a micrometer gauge—uniformity of finish.

Snug Fitting, Fast Cutting, Long Wearing

Every New "Coes" customer means a new "Coes" advocate —a new "Coes" advertiser.

A trial order will decide your source of Planer Knives Supply.

Remember the Name— Remember the Mark

We are independent manufacturers, members of no association, no trust, and we make the best knives.

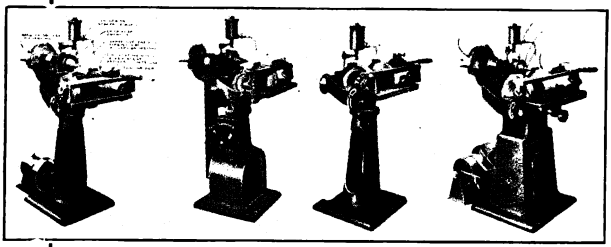
Loring Coes & Co.

Incorporated

Box C, Station B **WORCESTER, MASS.**

A GRINDER FO

Oliver Machinery Co.	Grand Rapids, Mich.
American Wood Working Machine Co.	Rochester, N. Y.
Baird Machinery Co.	Pittsburgh, Pa.
Kemp Machinery Co.	Baltimore, Md.
Syracuse Supply Co.	Syracuse, N. Y.
C. C. Wormer Machine Co.	Detroit, Mich.



THESE DISTRIBUTORS WHO HANDLE

Mummert-Dixon Oilstone Grinders

will be glad to show you why they answer every purpose, and why they are better than any other method of sharpening tools.

The general construction of ***Mummert-Dixon Oilstone Grinders*** — the rigid base on which they all set—makes them run smoothly, and entirely free from vibration.

MUMMERT-DIXON CO.

OLIVER MACH. CO., MANCHESTER

VERY PURPOSE

eneral Machinery Co. - - - - - - Spokane, Wash.
andyck-Churchill Co. - - - - - - - Philadelphia, Pa.
endrie-Bolthoff Mfg. & Supply Co. - - - - - Denver, Colo.
by Machinery Co. - - - - - - San Francisco, Calif.
. B. Mehring & Co. - - - - - - - - York, Pa.
. L. Essley Mach. Co. - - - - - - - Chicago, Ill.

lummert-Dixon Oilstone Grinders are made with very addition that may be needed in any plant, inluding grinding cone, leather wheel, emery wheel, oarse and fine oilstone wheels, special knife grinder, nd tool rest.

Ve also equip these Grinders with Special Motor)rive when desired.

end for our booklet showing complete description f the various makes of ***Mummert-Dixon Oilstone irinders.*** Tell us the kind of work you do in your iop, and we will show you the best grinder for your urpose.

: : Hanover, Pa.

AGENTS FOR GREAT BRITAIN

driven in on lower floor and be filled directly from bin above.

As power in plant is entirely mechanical, all these conveyers and fans operate by belts from various lineshafts. Wherever conveyers traverse open spaces between buildings they are carefully housed against weather. Entire conveying system is so that it will be of little difficulty to add one-third to equipment when final six sets are installed in main factory.

WORKING UP THE WASTE WOOD

LECTRICITY when obtained from outside the plant may introduce the problem of waste wood disposal, and we can get a wrinkle or two from Switzerland of the way they use up waste from machine woodworking establishments.

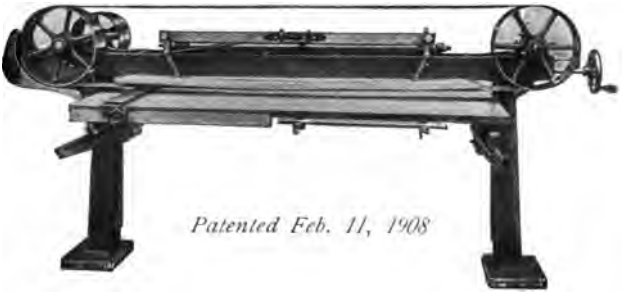
According to R. E. Mansfield of Zurich, they are cutting up the refuse into excelsior that formerly went into fuel.

It beats straw as a packing material because of lightness and elasticity.

For upholstery it retains elasticity longer than sea grass or hair. Moreover, the excelsior made from pine and fir contains enough resin to aid in protection of furniture from moths. For like reasons mattresses are being filled with pine and fir, and some grades of excelsior have been used by surgeons for bandages.

It is also employed for cleaning machinery, as it is claimed to be much less liable to spontaneous combustion than the cotton waste generally used for that purpose.

Our Twentieth Century
BELT SANDER



PERFECTION IN ITSELF

Will do double the amount of work of a hand block machine and do it better and easier.

Complete Control ***Only One Lever***

enables the operator to sand his work at any point, as much or as little as he pleases, without changing his position.

OUR SPECIALTY IS

RUBBING AND POLISHING MACHINES
BELT SANDERS
DOUBLE MITRE SAWS

Write for circulars to

Maddox Machine Company

Jamestown, N. Y.

The Phillips Dado Machine

Will Dado and Trim 600 Jambs per hour

With only one man necessary to do the work.

Discard the old saw table method, and put in this machine.

It is as simple as it is practical—and not expensive, either.

Write us today for price on this machine, also our special Casing Trimmer Attachment, which will be furnished additional if desired.

The Phillips Manufacturing Co.

Orlando, Florida

THE GUARANTEE BEHIND PERFECTIONS

The makers of Perfection Wood Steaming Retorts guarantee that you can, with their retort, steam stock in ten minutes that cannot be softened in less than one and one half to two hours by any other process; that a Perfection Retort will reduce your loss from breakage 50%, prevent staining, crimping or buckling, increase your output, lower your costs, save time and floor space and do away with leaking and escaping steam.

Are you going to send for a retort on 30 days' free trial? *New catalog on request.*

Perfection Wood Steaming Retort Co.
PARKERSBURG, W. VA.
Address Dept. C. for quick reply.

Start a Business of Your Own

The "OBER" LINE of HANDLE MACHINERY will help you

LATHES, SANDERS, RIP SAWS, CUT-OFF SAWS, BOLTING SAWS, ETC., for getting out HANDLES of various kinds, WHIFFLE-TREES, NECK YOKES, SPOKES, BALL BATS, SPINDLES AND VARIETY WORK.

OBER MACHINES are MODERATE IN COST, EASY to OPERATE, STRONG and DURABLE.

Write for free information and Catalogue No. 23

THE OBER MFG. CO. Chagrin Falls, O., U.S.A.

Any Speed from
0 Feet to 100 Feet a Minute

YOU CAN RUN THE

Holmes No. 46
Variable Feed Planer

Always produces a smooth surface.

Handles any size stock, even as large as 24 in. wide and 8 in. thick.

Made just right and mechanically perfect in every detail.

Ask us the prices

. & B. HOLMES MACHINERY CO.

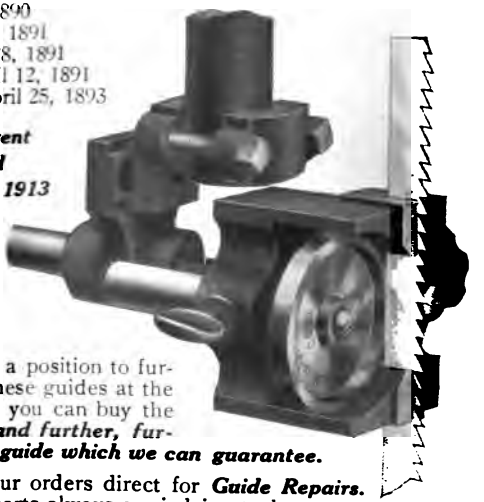
33 Chicago St. **BUFFALO, N. Y.**

WARNING!

Poor imitations of our Guide are on the market. Avoid any possibility of claim suits by sending us your orders direct.

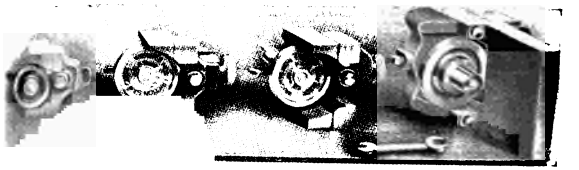
PATENTED
Aug. 12, 1890
Feb. 10, 1891
Mar. 28, 1891
April 12, 1891
April 25, 1893

New Patent Issued March 4, 1913



We are in a position to furnish you these guides at the same price you can buy the imitation, ***and further, furnish you a guide which we can guarantee.***

Send us your orders direct for ***Guide Repairs.*** Duplicate parts always carried in stock.



es E. Wright Co.

Kenilworth, N. J.

Wood Craft in writing)

TO get the maximum capacity from your Continuous Feed Jointer, you should fit it with the Genuine Morris Wood & Sons 20th Century Solid Steel Guaranteed Glue Joint Cutters.

These cutters will be furnished on your new Jointer if you insist upon it. *Our Guarantee:* Better cutters have never been produced. Our thirty-eight years of cutter-making reputation back this guarantee. Can you beat it? Better get a line on our prices.

Write now for Circular W. C.
It tells all about them.

MORRIS WOOD & SONS

5108-5110 W. Lake St. CHICAGO, ILL.

WARNING!

Poor imitations of our Guide are on the market. Avoid the possibility of claim suits by sending us your orders direct.

PATENTED
Aug. 12, 1890
Feb. 10, 1891
Mar. 28, 1891
April 12, 1891
April 25, 1893

New Patent Issued March 4, 1913

We are in a position to furnish you these guides at the same price you can buy the imitation, ***and further, furnish you a guide which we can guarantee.***

Send us your orders direct for ***Guide Repairs.*** Duplicate parts always carried in stock.

TO get the maximum capacity from your Continuous Feed Jointer, you should fit it with the Genuine Morris Wood & Sons 20th Century Solid Steel Guaranteed Glue Joint Cutters.

These cutters wi[illegible] furnished on your new Jointer if yo[illegible] it. Our Guarantee: Better cutte[illegible] been produced. Our thirty-eig[illegible] [illegible]-making reputation back this [illegible] you beat it? Better get a li[illegible]

st

[illegible] W. C.

[illegible] them.

[illegible]anadian [illegible]ood [illegible]ia

[illegible]OD & SONS

CHICAGO,

THE COAST LINE TO

MACKINAC

DETROIT, CLEVELAND, BUFFALO, NIAGARA FALLS.

TOLEDO, PT. HURON, ALPENA, ST. IGNACE.

"THE LAKES ARE CALLING YOU"

ARRANGE your vacation or business trip to include our palatial lake steamers. Every detail that counts for your convenience and comfort has been provided.

Daily service between Detroit and Cleveland, and Detroit and Buffalo. Day trips between Detroit and Cleveland during July and August. Four trips weekly from Toledo and Detroit to Mackinac Island and way ports. Special Steamer Cleveland to Mackinac Island two trips weekly June 25th to September 10th, making no stops enroute except at Detroit every trip. Daily service between Toledo and Put-in-Bay June 10th to September 10th.

Railroad tickets accepted for transportation on D. & C Line steamers in either direction between Detroit and Buffalo or Detroit and Cleveland.

Send two-cent stamp for illustrated pamphlet giving detailed description of various trips. Address L. G. Lewis, General Passenger Agent, Detroit, Mich.

Detroit & Cleveland Navigation Company

Philip H. McMillan, *President.*
A. A. Schantz, *Vice Pres. and Genl. Mgr.*

Fare $3.00

——DAILY BETWEEN——

Cleveland and Buffalo

THE GREAT SHIP "SEEANDBEE"

Length 500 feet; breadth 98 feet, 6 inches: 510 staterooms and parlors accommodating 1500 passengers. Greater in cost—larger in all proportions—richer in all appointments—than any steamer on inland waters of the world. In service June 15th.

Magnificent Steamers "SEEANDBEE," "City of Erie" and "City of Buffalo"

Daily—CLEVELAND and BUFFALO—May 1st to Dec. 1st

Leave Cleveland -	8:00 P. M.	Leave Buffalo -	8:00 P. M.
Arrive Buffalo - -	6:30 A. M.	Arrive Cleveland	6:30 A. M.

(Central Standard Time)

Connections at Buffalo for Niagara Falls and all Eastern and Canadian Points. Railroad tickets reading between Cleveland and Buffalo are good for transportation on our steamers. Ask your ticket agent for tickets via C. & B. Line. Write us for handsome illustrated booklet free.

THE CLEVELAND & BUFFALO TRANSIT CO., Cleveland, O.

WARNING!

Poor imitations of our Guide are on the market. Avoid a possibility of claim suits by sending us your orders dire

PATENTED
Aug. 12, 1890
Feb. 10, 1891
Mar. 28, 1891
April 12, 1891
April 25, 1893

New Patent Issued March 4, 1913

We are in a position to furnish you these guides at the same price you can buy the imitation, ***and further, furnish you a guide which we can guarantee.***

Send us your orders direct for ***Guide Repairs.*** Duplicate parts always carried in stock.

The Charles E. Wright Co.

Sole Manufacturers **Kenilworth, N.**

(Mention Wood Craft in writing)

Fare $3.00

——Daily Between——

Cleveland and Buffalo

THE GREAT SHIP "SEEANDBEE"

Length 500 feet; breadth 98 feet, 6 inches; 510 staterooms and parlors accommodating 1500 passengers. Greater in cost—larger in all proportions—richer in all appointments—than any steamer on inland waters of the world. In service June 15th.

Magnificent Steamers "SEEANDBEE," "City of Erie" and "City of Buffalo"

Daily—CLEVELAND and BUFFALO—May 1st to Dec. 1st

Leave Cleveland -	8:00 P. M.	Leave Buffalo -	8:00 P. M.
Arrive Buffalo - -	6:30 A. M.	Arrive Cleveland	6:30 A. M.

(Central Standard Time)

Connections at Buffalo for Niagara Falls and all Eastern and Canadian Points. Railroad tickets reading between Cleveland and Buffalo are good for transportation on our steamers. Ask your ticket agent for tickets via C. & B. Line. Write us for handsome illustrated booklet free.

THE CLEVELAND & BUFFALO TRANSIT CO., Cleveland, O.

THE COAST LINE TO

MACKINAC

DETROIT, CLEVELAND, BUFFALO, NIAGARA FALLS.

TOLEDO, PT. HURON, ALPENA, ST. IGNACE.

"THE LAKES ARE CALLING YOU"

ARRANGE your vacation or business trip to include our palatial lake steamers. Every detail that counts for your convenience and comfort has been provided.

Daily service between Detroit and Cleveland, and Detroit and Buffalo. Day trips between Detroit and Cleveland during July and August. Four trips weekly from Toledo and Detroit to Mackinac Island and way ports. Special Steamer Cleveland to Mackinac Island two trips weekly June 25th to September 10th, making no stops enroute except at Detroit every trip. Daily service between Toledo and Put-in-Bay June 10th to September 10th.

Railroad tickets accepted for transportation on D. & C. Line steamers in either direction between Detroit and Buffalo or Detroit and Cleveland.

Send two-cent stamp for illustrated pamphlet giving detailed description of various trips. Address L. G. Lewis, General Passenger Agent, Detroit, Mich.

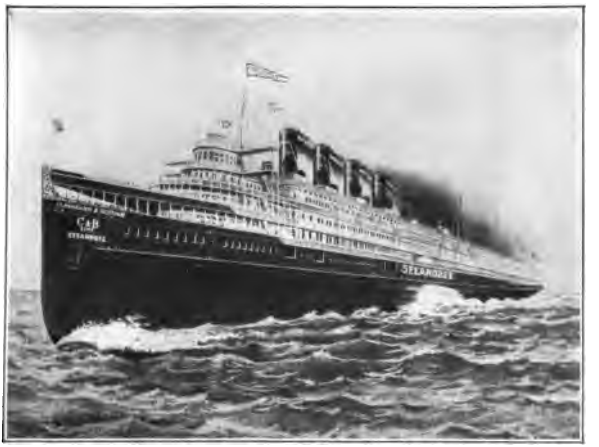
Detroit & Cleveland Navigation Company

Philip H. McMillan, *President.*
A. A. Schantz, *Vice Pres. and Genl. Mgr.*

Fare $3.00

——DAILY BETWEEN——

Cleveland and Buffalo



THE GREAT SHIP "SEEANDBEE"

Length 500 feet; breadth 98 feet, 6 inches: 510 staterooms and parlors accommodating 1500 passengers. Greater in cost—larger in all proportions —richer in all appointments—than any steamer on inland waters of the world. In service June 15th.

Magnificent Steamers "SEEANDBEE," "City of Erie" and "City of Buffalo"

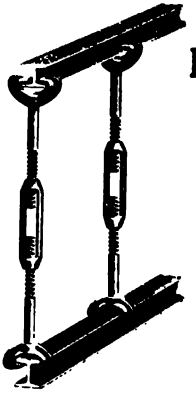
Daily—CLEVELAND and BUFFALO—May 1st to Dec. 1st

Leave Cleveland -	8:00 P. M.	Leave Buffalo -	8:00 P. M.
Arrive Buffalo - -	6:30 A. M.	Arrive Cleveland	6:30 A. M.

(Central Standard Time)

Connections at Buffalo for Niagara Falls and all Eastern and Canadian Points. Railroad tickets reading between Cleveland and Buffalo are good for transportation on our steamers. Ask your ticket agent for tickets via C. & B. Line. Write us for handsome illustrated booklet free.

THE CLEVELAND & BUFFALO TRANSIT CO., Cleveland, O.



SINGLE BEAM
RETAINING CLA

A mighty good thing for Hand Scr
other Veneer Presses, and practically i
ble for the Hydraulic Press. They are
and durable, save fully half your tim
adjust quickly to different widths.

No. 1 for stock up to 18" wide
No. 2 for stock up to 24" wide
No. 3 for stock up to 30" wide
No. 4 for stock up to 36" wide
And larger sizes.

State daylight of your press and Clam
will be made accordingly.

ORDER A SAMPLE LOT

***Everyone who tries buys a fu
equipment: There is a reason***

CHAS. E. FRANCIS CO. - Rushville, In

Specialty Manufacturers Glue Room Equipment

THE
WEATHE
INDIVIDU
Glue Hea

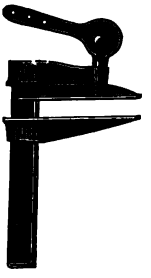
*Send your addr
receive descriptive
lar of Glue Heate
Cookers and Hot
with prices.*

The Weatherl

Grand Rapids, -

Extensively used by th
Rapids furniture

THE UNIVERSAL CLAMP

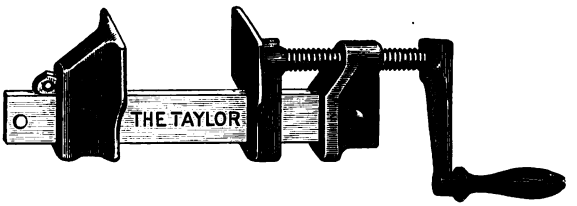


is a Time Saving, Quick Acting Clamp, especially adapted to Veneering, Paneling, and all kinds of work requiring long, broad jaw.

ASK FOR CATALOGUE No. 252

BATAVIA CLAMP CO.

165 Center Street, Batavia, N. Y., U. S. A.



How Long Will TAYLOR Clamps Last?

"Oh, forever," answered a man who had been selling them for over ten years. "I have never yet seen one of them out of business, except when it had been through a fire or subjected to some abnormal usage. Even then they can be fixed up, for the quality is there."

Taylor Clamps Give Universal Satisfaction

Ask us for our booklet showing names of the largest firms in the country who use Taylor Clamps. Their experience is worth knowing.

James L. Taylor Mfg. Co. : Poughkeepsie, N. Y.

"ANDREWS"

Condensing Moist Air Lumber Driers

ARE ALWAYS ON THE JOB.

Changes in Barometer Pressure, Wind Pressure or Wind Direction cannot affect the drying of the Lumber in the ***"Andrews" Condensing Kilns.***

Lumber dried in these Kilns is of uniform dryness, soft in texture and as free from checks and honeycombs as when put into the Kiln and it may be dried faster than in any other kiln.

Information for the asking.

DRIER DEPARTMENT

THE A. H. ANDREWS CO.

115-117 S. Wabash Ave.

CHICAGO, ILLINOIS

The Humason, Always Covered, Circular Saw Guard

It has been said the only way to prevent anyone who uses a circular saw from getting hurt is to box it up and not use it.

The Humason Saw Guard completely boxes the saw, but does not interfere with operating it: neither can it injure an operator in any way or interfere with the saw's efficiency.

When the piece to be sawed is pushed forward against small wheel on the front of guard the travel of rollers in the slots will raise guard until piece passes under, and the guard will rest on top of the piece until it is removed, when the guard will gravitate to its lowest point.

This guard is made of aluminum, is neat, light and durable can be installed on bracket, stand or ceiling attachment.

A large number of these guards are now in use and none have failed to give entire satisfaction.

Furnished complete, as shown in cut, except standard pipe and fittings. A man of ordinary mechanical ability can install one in a very short time.

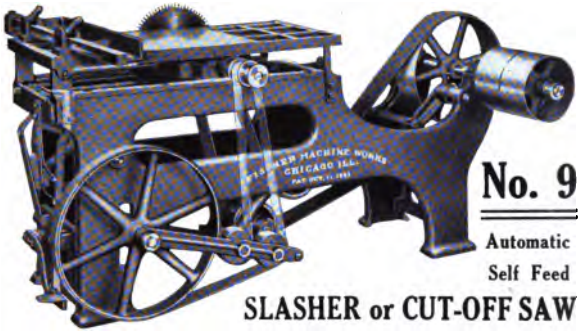
Price f. o. b. Youngstown

12 inch saw and smaller -	$25.00
14 and 16 inch saws - -	30.00
18 and 20 inch saws - -	32.00
22 and 24 inch saws - -	35.00

When ordering state if single or double arbor

Patented December 30, 1913

imason Brothers, 338 Emerson Place, Youngstown, O.



No. 9

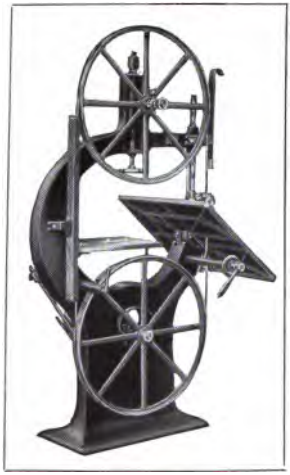
Automatic
Self Feed

SLASHER or CUT-OFF SAW

IF you make doors, sashes, blinds, furniture, boxes, car material or similar lines, write us for a free booklet on this Saw. **Mention seeing this ad in Wood Craft when you write.**

Fischer Machine Works

1841-45 Carroll Ave. **CHICAGO, ILL.**



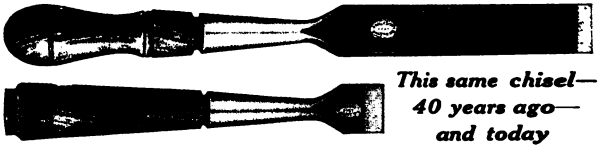
Saw Tables, Jointers, Swing Saws, Band Saws

SILVER'S New Woodworking Machines are newest, most improved tools on the market. In rigidity, in ease and convenience of operation, in moderate price, they beat all others to a frazzle.

Jointers—8, 12, 16, 20 and 24-inch.
Band Saws—20, 26, 32 and 36-inch.
Swing Saws—6½, 7, 7½ and 8-foot.

Send for Machinery Catalog No. 60

THE SILVER MFG. CO.
345 Broadway, Salem, Ohio



This same chisel—
40 years ago—
and today

It Took 40 Years to Wear Down This Chisel

and it is giving as satisfactory service today as when first bought.

BARTON EDGE TOOLS

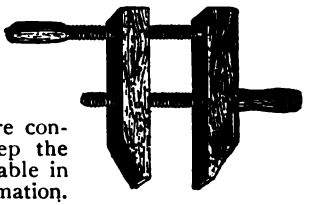
are made even better today than they were 40 years ago.

Specify them. If your hardware dealer should be unable to supply you, send to us for a catalog and our free Story Book entitled "True Stories." It is worth your reading.

MACK & COMPANY

Brown's Race near Platt St. ***ROCHESTER, N. Y.***

The Cabinet Maker's Money Savers



CHRISTIANSEN BENCHES AND HAND SCREWS

Last longer, wear better, more convenient, do better work, keep the workmen contented. Reasonable in price. Ask us for complete information.

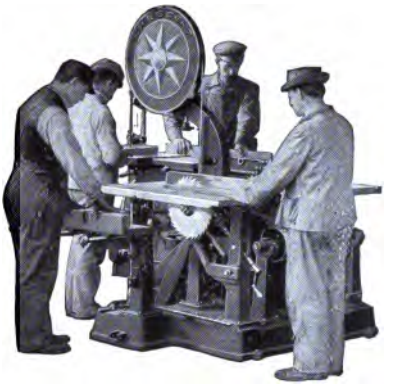
ASK US

C. CHRISTIANSEN
2225 Grand Ave.
CHICAGO, ILL.

YOU WILL SAVE MONEY

if before you invest in more equipment you investigate the

CRESCENT UNIVERSAL WOODWORKER



For nearly the price of one machine the Crescent will give you a Band Saw, Jointer, Shaper, Saw Table and Borer.

Each independent — each complete — and practical.

Our booklet shows just how well they are made. Write for it today.

THE CRESCENT MACHINE CO.

22 Columbia Street, - - - - - - - Leetonia, Ohio

The Best Groover or Dado Heads in America are COCKER'S

Sizes ⅛" to 2" or more in width.

YOU will also find the Cocker Shingle, heading, concave, resaws and chisel-tooth saws to be the best on the market. We make knives of every description. They are fully guaranteed.

Write us for prices and complete description

THE COCKER MFG. COMPANY

85 Market Street : Lockport, N. Y.

The MEETING PLACE of Employer & Employee

Advertisements under this heading FIVE CENTS PER WORD. Copy must be received not later than the 20th of the month preceding date of issue. If you do not find what you require, let us help you.

WANTED—MILLWRIGHT FOR WOODWORKING FACtory employing 800 men. Location Wisconsin. Address Box 303, care Wood Craft, Cleveland, Ohio.

POSITION WANTED—In woodworking factory, by experienced superintendent or foreman of recognized ability and character. Practical mechanic, expert on factory organization, cost keeping, modern manufacturing methods. Address Box 305, care Wood Craft, Cleveland, O.

SUPERINTENDENT WANTED FOR UP-TO-DATE pedestal extension plant. One capable of taking full charge from yard to finishing room. Must understand cost system. Right party may have interest in firm. State salary, experience and reference in first letter. Address Box 300, care Wood Craft, Cleveland, Ohio.

WILBUR R. SMITH

Industrial Engineering

Woodworking plants, box factories a specialty

609 E. 17th St., Alton, Ill.

MANUFACTURING IN CANADA

American manufacturers, contemplating the establishi
a factory in Canada, will save time by consulting us.
complete detailed information on every commercial
ing facilities, power rates, raw materials, labor co
details of vacant factories, inducements, etc.

F. Heaton's Agency. **Toronto, Ontario, Canada**

A GOOD PROPOSITION

Complete woodworking plant just built and equipped, up-to-date in every respect; suitable for any furniture manufacturer or woodenware specialty or vehicle bodies. Sawmill adjacent for special cut stock. Low power rate, good railroad facilities. Will lease on cash or percentage basis with privilege of purchase. A good proposition to the man with cash for operating expenses. Address

Commercial Association. **Crawfordsville, Indiana.**

WILLIAM H. SNYDER

General Sales Agent

Rotary cut gum box shooks, etc.
Dimension oak and hickory lumber.
Three-ply panels, door stock, crossbanding, drawer bottoms, etc.

Submit your specifications for prices.

838 Jefferson Ave. **Indianapolis, Ind.**

GERLACH

Circular, Band and Cylinder Saws

New Roller Saw Swage and Sharpeners

Are unexcelled in Europe or America. We use the best steel, the finest equipment, and have sixty years behind us.

The Peter Gerlach Company. **Cleveland, Sixth City.**

FREE SITE FOR BOX FACTORY

Liberal inducements to right parties. Water front. Right in the center of box wood territory. Write to

James H. McDonald,

Secy. Land & Power Co. **Rapid River, Mich.**

VARIETY LATHE

Goodspeed Variety lathe for sale. Used only two weeks. At a bargain for immediate sale.

312 No. Front St., Camden, N. J.

TENANT FOR WOODWORKING PLANT

Fine plant on railroad siding, considerable modern machinery, *vacant. City* wants industries. This is ready for *operation by live concern.* Full particulars on request.

Industrial Commission. **Ithaca**

MACHINERY SECTION

Lists of Second-hand Machinery, for Sale or Wanted, will be published in this department at the rate of 35 CENTS A LINE each issue (nine words to the line). Name and address are not counted in the space charged for. Copy must be received not later than the 20th of the month preceding date of issue.

FOR SALE

Lath mill and bolter combined, Frisby, nearly new, $100.
Mortiser, No. 3 Smith, $100.
Moulder, 6-in., 1-side, Smith, $70.
Moulder, 6-in., 2-side, Smith, $75.
Moulder, 7-in., 4-side, Powers, nearly new, $225.
Moulder, 9-in., 4-side, Houstan, $300.
Moulder, 12-in., 4-side, American, $600.
Moulder, 12-in., 4-side, Woods' inside, $250.
Planer and matcher, No. 44 Berlin, 9 x 6 in., $425.
Planer and matcher, Fay, 24 x 6 in., heavy, $400.
Resaw, band, American, 48-in. wheel, $600.
Resaw, circular, 42-in., $200.
Sawmill, band, 63-in. wheel, carriage 18 ft., $750.
Shaper, Indiana, 2-spindle, $110.
Surfacer, 26 in., Whitney single, with sectional feed rolls, $400.
Tenoner, Houstan, double head and 2 copes, $175.
Tenoner, Hall & Brown, double head, 2 copes and cut-off saw, $140.

Badger-Packard Machinery Co.

74-76 W. Water St. **Milwaukee, Wis.**

FOR SALE

Woodworking Machinery

Band resaw, 50", $250.
Blower fan, Fay, $15.
Box matcher, Egan, $100.
Door clamp, Fay, $85.
Mortiser, Houston, $35.
Moulder, 5", 3-side, $60.
Moulder, 8", 4-side, $125.
Planer, 24 x 6", Fay, $75.
Planer and matcher, 3 S., $200.
Ripsaw, self feed, $110.
Sander, 3d, 36", Berlin, $325.
Scroll saw, Beach, $20.
Tenoner roller table, $100.
Double fan, 40", $35.
Railway saw, $35.
Hood clamp, $20.
Mortiser, R. & P. table, $65.
Moulder, 6", 4-side, $100.
Moulder, 10", 4-side, $225.
Planer cabinet, 26", $175.
Planer and matcher, 4 S., $250.
Greenlee S. F. Saw, $135.
Sander, 30", double drum, $125.
Sander, 36", American, $375.
Sander, 40", double drum, $165.
Sander, 42", American, $425.
Shaper, double, Frank, $40.
Tenoner, slide table, S. H. $60.
Veneer presses, 12 x 42", $20.
Wood worker, 8", double, $135.

Woodworking Machinery Company. **Newport,**

REBUILT, TESTED AND GUARANTEED SECOND-HAND MACHINERY

Band saw, 36 in., with iron tilting table.
Boring machines, double and single.
Cabinet makers' benches, only a few left.
Glue spreader, 61-in., double, late pattern.
Glue heaters, several styles and sizes.
Hand planer, 24-in., modern tool, long tables.
Moulder, 7-in., 4-side, good make, powerful feed.
Mitering machine, large one on stand.
Rip saws, iron and wood frames.
Surfaces, 24 x 7 in., 26 x 6 in., 28 x 6 in., 32 x 8 in., single.
Shapers, double and single spindle.
Swing saws, three different kinds.
Sanders, 42 and 48 in., 3-drum, late type machines.
Tenoners, heavy double and single end, double heads.
Veneer presses, 12 x 32 in., 9 x 38 in. and 13 x 50 in., sectional type.

Mail us a list of your wants.

The John T. Towsley Mfg. Co.

Builders of Modern Woodworking Machinery, Gluing Appliances, Factory and Lumber Trucks.

1100 Evans St. **Cincinnati, Ohio.**

FOR SALE

Used Woodworking Machinery

Band saw, West Side Iron Works, 36 in.
Borers, 2 Andrew single-spindle, vertical.
Borer, M. L. Andrew 30-in. vertical, 4-spindle.
Borer, Bentel & Margedant, 2-spindle, hor. 1 to 6 in.
Dovetailers, Dodds', 9-, 12- and 24-spindle.
Edger, Fay & Egan, wood frame 10 ft.
Grinders, knife, B. T. & B. 44-in., Rogers 44-in.
Jointers, Buss 8-in., G. & K. 16-in., Cordesman 24-in.
Jointer, B. & M. 30-in. with power feed.
Moulders, 6-, 7-, 8-, 10- and 12-in. outside.
Planers, Clement 20-in. and 26-in., B. & M. 24-in.
Planers, single cabinet, Buss 30-in., 2 Dennis 30-in.
Planers, 2 American No. 4½, 24-in. single.
Sander, H. B. Smith 30-in., hand feed.
Sander, Mattison, No. 111 belt.
Saws, tilting table, 2 American No. 1. Egan & Co.
Saw, heavy rip, Fay & Egan, for 30-in saw.
Saw, Rowley & Hermance combination saw and dado.
Shapers, double spindle, Indiana, Buss.
Tenoners, J. A. Fay & Co., W. R. & R. wood frame.
Window frame machine, Smith & Phillips No. 3.

Ask for complete stock list No. 14.

The Chas. A. Strelinger Co.

Woodworking Dept. **96-110 Bates St., Detroit, M**

WAYNE REBUILT MACHINES ARE DEPENDABLE

Jointers

3 8-in. Sidney Tool Co.
1 8-in. Street Bros.
1 8-in. Williamsport.
1 12-in. Porter.
1 12-in. Street Bros.
1 12-in. Berlin.
1 12-in. Sidney.
1 16-in. Indiana.
4 16-in. Street Bros.
2 16-in. Sidney.
1 16-in. Egan Co.
1 20-in. Cordesman-Egan Co.
1 20-in. Clement "Perfection."
1 24-in. Buss Machine Works.
1 24-in. Indiana.
1 24-in. Bentel & Margedant.

Single End Tenoners

1 Cordesman-Egan Co.
1 No. 22 Newman Machine Co.
1 No. 225 H. B. Smith.
1 No. 3½ J. A. Fay & Co.
1 J. A. Fay & Co.
3 L. Houston & Co.
2 W. R. & R. wood frame.

Also

All other types of woodworking machines in proportion.
Seven hundred machines in stock.
No better selection in whole country.
All furnished under mutual plan.
Full protection assured purchaser.
Write for our monthly "**Wayne List,**" covering our whole complete stock.

Wayne Machinery Company,
(Successors to Hanna-Brackenridge Co.)
Fort Wayne, Indiana.

FOR SALE

12 Invincible and Columbia sanders, 30-in., 36-in. a 42-in. sizes. All carefully rebuilt and in good working orde
Also planers and matchers, surface planers, molders, r saws, cut-off saws, gang edgers, and many other woodworki machines of best standard makes; all in good working con tion and furnished at cost. Send for full information a prices.

H. B. Smith Machine Company. **Smithville, N.**

FOR SALE

Exhaust fan, dust-collecting outfit; also furniture poli achine.

ucas & Son. **3 Fox St., Bridgeport,**

OUT PRICES

In Modern Woodworking Machines

Band saw stretcher, Covel 8-in., $45.
Band resaw, Cordesman No. 3½, 42-in., used 6 months, good as new, 6 blades, only $350.
Bed clamp, Benedict, $50.
Blower, Sturtevant 25-in. for sawdust, $20.
Borer, Dennis horizontal with slide spindle, $50.
Box matcher with press, Chase, No. 227, pwr. fd., used 3 months, $175.
Combination saw, Burlington, $35.
Cut-off saw, Hamilton Auto Railway, No. 97, $75.
Cut-off saw, Beach, No. 3, box and furniture makers, double, good as new, $100.
Door clamp, Hall & Brown, 8 x 4, good as new, $85.
Dowel or rod mch., Hamilton 2-in. power feed, nearly new, $75.
Exhaust fan for shavings, Sturtevant 35-in., $25.
Floorer, S. A. Woods No. 2½, 15 x 6 in., 4-side, $235.
Glue heater, Francis No. 10, $5.
Lathe, Hoyt wagon axle, automatic, $100.
Lathe, Ober Broomhandle, auto, $50.
Lathe, Klotz, nearly new, spoke and handle, $100.
Lathe, Merritt table leg and baluster auto, $125.
Lock corner box machine, used 6 months, $275.
Mortiser, New Britain chain saw with 6 chains, good as new, $200.
Moulder, modern Hamilton, No. 28, 9-in. 4-side, rebuilt, $175.
Moulder, Smith 8-in. 4-side, rebuilt, $100.
Panel raiser, Smith upright hand feed, $45.
Planer and matcher, Ball 24-in., heavy single, $75.
Planer, Frank, 20 x 6, No. 101, double planer, modern, fine order, $150.
Planer, Superior 24 x 6 Pony Sgl., $75; Frank 20 x 6 Pony Dbl., $100.
Planer and matcher, G. & W. 26 x 6 4-side, $250.
Resaw, Fay No. 4, combined band, scroll and resaw, 42 in., rebuilt, $175.
Resaw, Goodell & Waters, 24-in. circular, rebuilt, $75.
Resaw, Smith, 36-in., 4-roll, $125.
Ripsaw, Williamsport, self feed, rebuilt, $75.
Sander, Cordesman-Meyer, 24-in., iron frame, hand feed, $50.
Sander, Fay & Egan, 48 in., dbl. disk, never used, $100.
Sander, H. D., feed, with 2 drums on one shaft, $25.
Saw gummer, Rogers Automatic circular, $25.
Scroll saw, Fay, iron table, $25.
Shaper, Egan single spindle with reverse counter, $65.
Shaper, Fay dbl. spindle, $35.
Siding resaw, McNish & Butler, 24-in., $50.
Tenoner, Fay double head and double cope, rebuilt, $100.
Woodworker, B. & M. 8-in. Universal and Combined 8-in. 4-side moulder, $200.
Woodworker, Fay 8-in. Universal, rebuilt, $110.
Woodworker, Fay & Egan No. 77 Variety, never used, with borer, $135.
Window frame machine, Smith & Phillips Perfect, $175.

This is only a partial list. We have just bought a furniture factory and planing mill. Machines not listed yet. Let us know what you want. We have it and at very low price.

Woodward Machinery Co. **514 Main St., Cincinnati.**

NOBLE BARGAINS

Why Buy "Scrap" at Machinery Prices When You Can Get Machinery at "Scrap" Prices, Rebuilt the "Noble" Way and Backed by a Half Million Dollar Guarantee

A few of the hundreds of bargains in stock:

36 in. Bentel & Margedant band saw, tilting iron table, rebuilt, $60.
36 in. Noble band saw, regular price $100, new, $85.
18 in. Crescent hand jointer, regular price $127.50, new, $95.
12 in. three-leg type hand jointer, new, $65.
20 x 6 Fay & Egan No. 2 pony planer, same as brand new, rebuilt, $90.
20 x 6 American "Jewel" pony planer complete, new, $95.
24 x 6 Hall & Brown No. 33 finishing planer, nearly new, rebuilt, $100.
24 x 6 C. B. Rogers & Co. dbl. belted planer, 4r driven, rebuilt, $100.
27 x 10 S. A. Woods No. 55 double surfacer, 6 rolls, rebuilt, $225.
24 x 6 American "Happy Thought" 3-side planer and matcher, rebuilt, $200.
24 x 6 Indiana No. 2½ "Clipper" 4-side planer and matcher, rebuilt, $225.
18 x 6 Josiah Ross "Little Giant" 3-side planer and matcher, rebuilt, $100.
Fay & Egan No. 2 horiz. hollow chisel mortiser, $450; rebuilt, $125.
H. B. Smith No. 185C double spindle shaper, nearly new, rebuilt, $90.
6-in. 4-side Rowley & Hermance moulder, a rare bargain, rebuilt, $100.
8-in. 4-side Colloday moulder, practically good as new, rebuilt, $125.
"Hoosier" self-feed rip saw No. 1, used only two weeks, rebuilt, $110.
Fay & Egan jig saw, same as brand new, a big bargain, rebuilt, $20.
Waymoth No. 1 variety lathe, latest style, nearly new, rebuilt, $75.
Egan 30-in. 2-drum power feed sander, well worth $225; rebuilt, $150.
Invincible 30-in. 3-drum power feed sander, worth $300; rebuilt, $190.
Swing saws: Porter single arm, $18; Greaves & Klusman, rebuilt, $18.
Famous single arm swing saw, 6 ft. cast frame, new, $28.
No. 27 combination rip and cut-off saw table complete, new, $50.
38 in. B., T. & B. style E knife grinder and saw gummer, $85; rebuilt, $40.
Bentel & Margedant 8-in. Universal woodworker and 4s molder, rebuilt, $290.
Fay & Egan No. 1 railway saw, nearly new, rebuilt, $50.
Fay single end tenoner, double heads and copes, rebuilt, $70.

A machine to fit every need of the woodworking industry. Write us.

Noble Machine Co. Ft. Wayne, Ind.

BARGAINS EXTRAORDINARY

WOODWORKING

10-in. 4-side molder, Colloday.
36-in. automatic knife grinder.
16-in. hand jointer, Goodell & Waters.
Alber stair router.
30 x 6 J. A. Fay & Co. double surfacer, divided feed rolls, cabinet type, A-1 condition, $300.
30 x 8 Money Maker double surfacer, weighing about 10,000 lbs., A-1 condition, $400.
15-in. 4-side inside matcher, J. A. Fay & Co. make, fine condition, $250.
7-in. 4-side Holmes Atlantic inside matcher in fine condition, $200.
15 x 6 J. A. Fay & Co. inside matcher in fine condition, $250.
15 x 6 J. A. Fay & Co. inside matcher in fine condition, $350.
24 x 6 planer and matcher, 4-side.
2-saw edger, 24-in., in fine condition, $50.
Cabinet single surfacer.
Tenoning machines.
Double cut-off saws.

SPECIAL BARGAINS IN SANDERS

42-in. 3-drum Perfection sander, thoroughly overhauled, $350.
48-in. 3-drum Thomas sander, $400.
48-in. 3-drum H. B. Smith sander, $500.
54-in. 3-drum J. A. Fay & Co., fine order, $500.
48-in. 3-drum Royal Invincible sander, $550.
60-in. 3-drum Columbia sander, in A-1 condition, $600.

JOINTERS

18-in. Crescent hand jointer.
16-in. Goodell & Waters hand jointer.
18-in. Crescent hand jointer, in A-1 condition, $90.
30-in. Buss extra heavy hand jointer, $125.

Woodworking machinery of all kinds.
Write, stating your requirements.

LEVELAND BELTING & MACHINERY CO.

1922 Scranton Road, Cleveland, Ohio

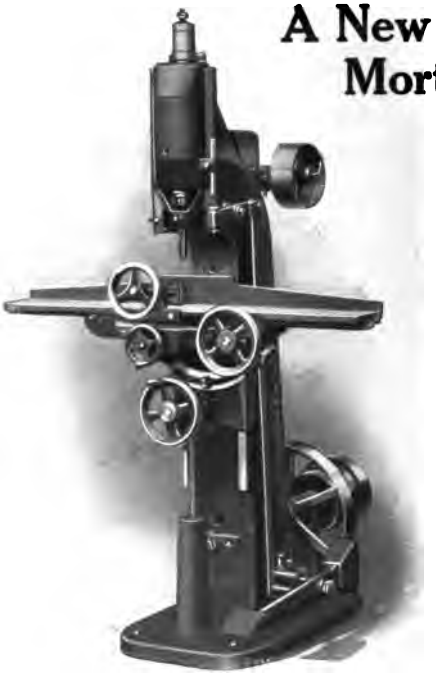
ESTABLISHED
1847

[redacted]

INCORPORATED
1878

Woodworking Machinery

A New Power Mortiser



The Engraving shows a ***New Power Mortiser*** to operate hollow chisels which are brought into the work by ***Power.*** Fitted with ***Tilting Table*** having Rack and Pinion Feed.

Will work all kinds of wood.

Send for Circulars

H. B. SMITH MACHINE CO.

SMITHVILLE, N. J., U. S. A.

New York **Chicago** **Atlanta** **San Francisco**

CLARAGE

REPRESENTS THE BEST

In not only fans for shavings and dust exhaust systems, but for Blowers, Hot Blast Factory Heating Installations, Dry Kilns, etc.

Every part of the material and design of our Blowers is the result of our expert study and engineering work in this field.

Not the least important is the special Clarage Bearing, which plays a vital part in every fan system we install. It means long and satisfactory service.

Our engineering department will gladly advise you as to the fans that are best adapted to your work. Consult us.

CLARAGE FOUNDRY & MFG. CO.
HEATING, VENTILATING AND DRYING ENGINEERS
KALAMAZOO, MICH.

EASTERN BRANCH — 149 BROADWAY, NEW YORK, N. Y.

This Chain Saw Morti

Gives you through its continuous feed a machine w
will reduce your mortising time 80%.

Without boring or leaving any core to clean, you ca
a mortise six inches deep in six seconds in this

"NEW BRITAIN" MACHIN

There is not a waste motion in its operation.

Write us for further particulars in reference to this
method of mortising.

THE New Britain Machine C

16 Chestnut St. **NEW BRITAIN, CO**

1914

WOODCRAFT

AUGUST ··· 1914

POWER'S
No. 14 SURFACER

¶ This machine is designed for either single or double surfacing. It is medium weight, quick, accurate and strongly built.

¶ All the special value features and high-grade workmanship, which has made the POWER line famous, are incorporated in this surfacer.

¶ Its special features of single or double surfacing makes it worthy of your special consideration, and it will pay you to investigate it.

Wm. H. Field Co.
Boston, Mass.

Olney & Warrin
New York

L. Power & Co.

6 South 23rd Street
Philadelphia, Pa.

Eby Machinery Co.
San Francisco, C

Zimmerman-Wells
Brown Co.
Portland, Oregon

***We make* Band Saw Blades of Imported Steel**
They Last Longer

Handy Clamps are Better

No. F

Screw is 2 inches above Tempered Steel Bar,

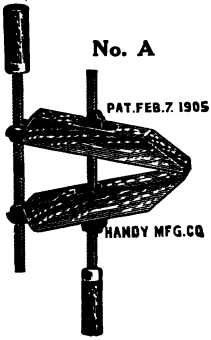
No. C

Tempered Steel Bar Clamp

Guaranteed not to buckle the work.

Tempered Indestructible Steel Bar Clamps. Screw work in two bearings, increasing the life of the clamp over 100 per cent.

"Handy" Patented Steel Spindles and Steel Nuts on "Hand Screws" guaranteed not to break.



No. A

Can be kept rigid or attached in any position.

Strongest Hand Screw Made

Works nearly ***twice as fast*** as common wood screws. Spindles have a right and left hand thread. Gives a tighter grip and less power required. Glue cannot stick to spindles. Handles guaranteed not to get loose. Jaws are best seasoned maple.

Try our "Mitre" Clamp also our "Frame" Clamp.

....ORDER SAMPLES....

Send for Catalogue and Prices of Full Line of Clamps

HANDY MFG. CO.

27 E. Madison St. CHICAGO

Patent Fluting and Twist Machin

THIS machine will produce all kinds of spiral or rope mouldings, either straight, tapered, curved or oval. It will make right, left, and pineapple cuts, and will do straight, and irregular fluting. It will cut from one to six threads on a piece, and will make any degree of twist from one turn in one and one-half inches of length to one in ten and one-half inches. The cutters are similar in shape and arrangement to those used on variety shapers, and are made of the same steel. They revolve always in the same direction, whether the twist be right or left, and one set will produce several different shapes of work. Changing from one degree of twist to another, or from right to left, takes less than one minute. This machine will swing eight inches, and will take 5 feet to 10 feet between centers, according to length ordered.

If interested in Woodworking Machinery, write us.

P. Pryibil Machine Company

512-524 W. 41st Street New York C

Published by
THE GARDNER PRINTING COMPANY
CAXTON BUILDING · CLEVELAND, OHIO

VOL. XXI AUGUST 1914 No. 5

WRINKLES FOR WOODWORKERS

There's one thing about lending, either of money or tools, it does help the memory.

Belts are to be guarded under table of vertical spindle shapers and the cutter guards kept in use.

A mighty good plan is to see that in heavy lifting the men are properly trained so they will act exactly together in taking hold or letting go. A still better plan is to use a hoist.

It's as natural as can be for a long, loose sleeve to reach out for trouble and drag someone's arm along with it. Have sleeves short and close fitting and *they will have a fair* chance to dodge out of the way *of hooky screws* or biting gears.

New catalogue from the Stow Mfg. Co., Binghamton, N. Y., shows many varieties of portable electric and other tools for grinding, sanding, drilling, buffing, etc.

Peter Cooper's Glue Factory, Brooklyn, N. Y., has been reincorporated, combining its interests with those of Richard Wilhelm of the Eastern Tanners' Glue Co., Gowanda, N. Y. There is to be no change in the business of the Peter Cooper's Glue Factory, but a new plant is to be erected for the manufacture of glue by Peter Cooper's methods and to be tested and graded by that 87-year-old standard and system.

A recent edition of the "Handbook" is furnished gratis by Henry Disston & Sons, Philadelphia, Pa., and is a mighty interesting treatise, giving as it does historical as well as technical particulars of saws and other Disston products. The firm makes bandsaws 18 inches wide, 64 feet long, and also makes bandsaws with teeth on both edges to cut both ways, these saws being as large as 17 inches wide, 53 feet long. Handbook is crowded with valuable information of profit to all users of woodworking tools.

Morris Wood & Sons, 5108-5110 W. Lake street, Chicago, Ill., make a grinder that keeps cutters in perfect condition and balance. Imperfect grinding wastes cutters, but this grinder gets full value out of them and also saves the operator's time. Only a few minutes are required to accurately grind a pair of cutters, and it requires no former experience. Machine is furnished complete with grinding wheel *and* countershaft. Complete particulars of this machine are given in Bulletin No. 7, which Morris Wood & Sons will send to you anywhere on request.

SAFE METHODS AND TENONING MACHINES

Two pictures that graphically tell how a hand was robbed of its fingers and how they could have been saved; the engravings also show that the dangerous bungling way is at best but little likely to do neat work in wood — and the moral of the mishap is just this: use the machine facilities for all they are worth

FROM A. C. McNeill of the Canadian Car & Foundry Co., Montreal, Canada, we have received the two photographs here reproduced. The one graphically portrays the manner in which a serious accident occurred in the

How the Operation Should Be Performed — Operator is Starting the *Table* Forward, the Pressure Bar Securely *Holds Block of Wood*, and Operator's Hand Is Entirely *Out of Danger*, while the Work Is Performed Quickly

planing-mill, the other shows how the mishap might have been avoided.

While operating a tenoning or gaining machine the workman held the lumber in his hands instead of using the presser bar and post already provided

How an Accident Happened As a Result of Non-use of Safety Appliances Provided with Machine—Operator Is Seen Gripping Block of Wood with Both Hands and Horizontal Knives Have Thrown Block Back on the Vertical Knife, Left Hand of Workman Is Being Dragged Under Cutter. Note that Presser Bar Is Lying Idle at Back of Table and Vertical Post at Front Has Been Removed, but this Saves Neither Time Nor Fingers

for the purpose of preventing accidents. After safely gaining the piece, he pushed the material onward to the coping head.

Here the workman got into trouble. The greedy head yanked the piece of lumber away from the oper-

ator's hands, at the same time forcing the gage out of position. Result was that the left hand was drawn under the gaining head where four fingers were cut.

Injuries of this kind react depressingly upon everyone in the neighborhood of them and we should all see that the full advantage is taken by the workmen of any safety appliances that are available.

VALUE OF A UNIFORM COST SYSTEM

Information to be obtained from the efficient system of costs, use of the data given by the reports, proportions of materials and labor to volume of business, profitable patterns, relative gains or losses of departments, and benefits of a uniform system of costs

FREDERICK B. SMITH, of Detroit, Mich., read a paper before the recent convention at Chicago of furniture manufacturers from which a number of extracts are made: System should give accurate information economically; enable an executive to know how and where to cut down operating expenses safely, from a careful analysis of reports brought in, and where overheads are higher in departments than they should be, and where the product turned out is not up to amount it should be, based on cost of labor and material; enable executive to know definitely that all items are properly included in overheads, that everything that is not charged directly to labor or material must be in overhead; proper cost system is of the accounting end of business, and not only shows analysis of labor, material and overheads by departments, but *also furnishes a balance* of your business, and a correct statement of the business situation monthly,

in other words, a perfect running inventory, complete balance sheet.

It gets down to brass tacks on consumptior distribution of material and labor, so at er month you know whether materials, stoc process, and finished stock are in right propor to volume of business.

No possible good can be obtained from any unless it is intelligently and earnestly kept up day. Reports must be in such shape that they be called upon for reliable information whe desired. An inefficient cost system is more da ous than no system because in one case estir give some idea of your business, and in the case you are getting incomplete and misle information.

System once installed, the organization as a v must take hold of it in right spirit. It shou kept entirely apart from the factory side so f compiling information is concerned, and yet in harmony with factory end of business, so f furnishing information as to the conditions exist is concerned. It should work entirely from sales department, and yet be in such s that executive can immediately point out to department that certain goods are unprofitabl

It is just as important to discontinue an unp able pattern, and more important than it is to a new one to the line. Danger with all is the bi ening of our lines. As manufacturers we are to carry among good sellers unprofitable patt

If proper cost and efficiency methods work o *does not* take long for departments of a busin *work* in harmony with it, and the various

ments will have results each month to know whether they are gaining or losing.

A great many plants today haven't attempted to install a cost system, because they do not know what system to put in, what it would cost to operate it. That is where the federation of cost and efficiency will help the various plants in establishing more universal cost knowledge in their business, and thereby benefit the industry as a whole. The average manufacturer who has had any experience and established a system that is satisfactory to himself, is willing to place that knowledge at the disposal of other manufacturers for the purpose of benefiting the industry as a whole.

If a uniform plan can be worked out that will give general satisfaction, which I understand has been done to quite an extent in some branches of our industry, not only the members who haven't established a proper cost system will be benefited, but an exchange of knowledge on the part of those who now employ systems will be beneficial. If a number of our leading manufacturers put all their knowledge in a melting pot, through a proper plan, and get it simmered down to what is good for the industry, we can establish a general plan.

I can speak from a long experience in developing cost and efficiency methods in our own plant, and will be very glad to work in harmony with any plan that may be adopted for the good of the industry as a whole.

According to the Department of Commerce the United States has some three thousand billion feet of standing timber, and allowing for the yearly *growth of its forests* it is reducing its stock of *stumpage at the* rate of sixty or more billion feet *annually.*

TECHNICAL QUALITIES OF THE WOODS

Handy tables showing clearly and concisely the various qualities of woods — their hardness, ease of splitting, elasticity, relative values as fuel, and the several degrees of durability exhibited by them

HERMANN VON SCHRENK gives the accompanying table of wood qualities as showing in compact form the leading peculiarities of various materials. It will be readily seen from this rough but convenient comparison how any commercial wood may fill require-

HARDNESS

Hard	Medium	Soft	Very Soft
Hickory	Ash	Chestnut	White pine
Dogwood	Oak	Tulip-tree	Sugar pine
Sugar maple	Elm	Sweet gum	Sequoia
Sycamore	Beech	Douglas fir	Paulownia
Locust	Cherry	Fir	Willow
Hornbeam	Mulberry	Yellow pine	
Persimmon	Birch	Larch	
	Sour gum	Linden	
	Longleaf pine	Horse-chestnut	
		Hemlock	
		Cottonwood	
		Spruce	

CLEAVABILITY

Hard to Split	Medium to Split	Easy to Split
Black gum	Oak	Chestnut
Elm	Ash	Pines
Sycamore	Larch	Spruce
Dogwood	Cottonwood	Fir
Beech	Linden	Cedar
Holly	Yellow poplar	
¹aple	Hickory	
·ch		
·nbeam		

fference in Hardness and Cleavability of Varie

ELASTICITY

Very Elastic		Less Elastic	
Yew	Red cedar	Cottonwood	Walnut
Larch	Lancewood	Birch	Yellow pine
Fir	Spruce	Maple	Yellow poplar
Locust	White pine	Elm	Beech
Chestnut	Ash	Alder	
Hickory	Oak		
Osage Orange			

HEATING POWER PER CORD

Best	Good	Moderate	Bad
Hickory	Oak	Spruce	White pine
Beech	Ash	Fir	Alder
Hornbeam	Birch	Chestnut	Linden
Locust	Maple	Hemlock	Cottonwood
Heart pine		Sap pine	

LASTING POWER

Very Durable	Durable	Short-lived
Walnut	Ash	Beech
Locust	Larch	Sycamore
Sequoia	Yellow pine	Birch
Cedar	Spruce	Linden
White oak	Fir	Cottonwood
Catalpa	Yellow poplar	White pine
Sassafras	Douglas fir	
Chestnut		
Longleaf pine		
Cypress		

Difference in Elasticity, Heating Power and Durability of Various Woods

ments. In mentioning the strength of yellow pine, which is freely used for construction purposes, he pointed out that with a small amount of sapwood yellow pine combines with its strength a very considerable power of resistance to decay. When the wood must have exceptional lasting qualities prefer-

ence was given to cypress. Tupelo was also credited with easy working and a twisted grain that would not sliver, a quality that in many years' use at a skating rink floor had withstood abrasion.

Dr. von Schrenk alluded to the advantageous resorting of stock according to character of grain, position of knots, etc., which have an important relation to the true grading of stock.

Piling of stock to prevent further checking when outdoors was advised by the use of wide crossing strips on the south side of the piles. This was especially urged with the use of thick stock. These crossing strips extend beyond the ends of the lengths of lumber and shade the ends, thereby reducing the amount of checking.

Many a cutter is imperfectly ground by hand because the workman is overproud of his skilled touch. Time is lost in grinding and using the cutter, steel is wasted by uneven grinding, and the cutting of stock is delayed and bungled, because advantage may not be taken of the machine way of getting there. A keen workman looks sharp after his tools.

Secretaries Redfield and Houston of the Departments of Commerce and of Agriculture have joined forces to establish the essential facts relating to the supply, exploitation, and marketing of timber and to analyze underlying causes. Plan is to aim at dealing helpfully with the various problems presented, and to indicate as far as may be practicable any measures which should be adopted by the industry itself or by the public in relation to the industry.

The two and a half billion dollars export trade per year of the United States represents about $25 per capita.

PRACTICAL SUGGESTIONS FOR DRAWINGS

Choice and use of materials, and a number of very convenient kinks for service at the drawing-board

USE a pencil that makes good black lines easily seen through tracing-cloth or tracing-paper. The harder the lead, the less wear; but lines are little use unless plain. Thicker lines are less strain on eyes.

Fig. 1

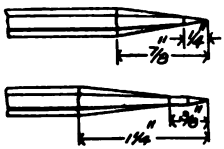


Fig. 2

Fig. 3

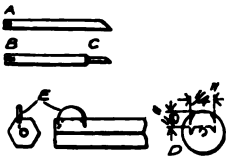


Fig. 4

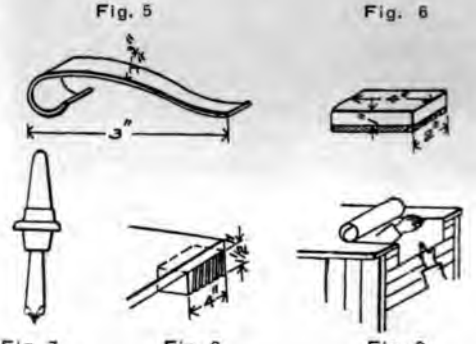
Some Suggestions for the Making of Sketches

On white paper to be traced over, never use pencil harder than 4H. With darker shades of drawing papers use a pencil marked 1H or 2H.

When cutting a point on a pencil don't whittle the end bearing number or grade of hardness. Most points on drawing-pencils are not cut back far enough (Fig. 1). The more slender the point the less it obscures vision when drawing. Fig. 2 shows practical dimensions for point on a drawing-pencil.

When pencil becomes too short to handle, the wood can be cut away and lead saved and used in compasses. These can be broken up into convenient lengths. Most drawing-pencils are marked with a number followed by letter H; these short le

should also be marked. This can be done by filing short lines near ends of leads, as shown in A and B, Fig. 3; which are 3H and 4H respectively. If end of lead used in short compasses is reduced as at C, Fig. 3, the point can be seen better when setting it to a dimension, and when scribing a radius or a circle.



Sundry Conveniences for the Making of Sketches

Since more weight is borne on pencil than compasses when making lines, it is best to use lead one degree softer in compasses than that in pencil in order to have curved lines same weight as the straight lines.

Fig. 4 shows a simple means of keeping pencils from rolling off drawing-board. File head of a thumb-tack D into semi-circular piece which is shown in the dotted lines, and drive it in pencil, as at E.

Fig. 5 is a thumb-tack lifter, easily made from
ıt thin sheet-steel. Lay it flat on drawin
force under tack, then raise slight
rce up tack.

Fig. 6 is a handy pad for rubbing down the glazed side of tracing-cloth with chalk or pounce. It is a wood block having felt strips glued on the underside. After a tracing has been sprinkled once and rubbed down, the felt will retain most of chalk or powder used, and pad can be used several times without resprinkling cloth.

Quills of corks in bottles containing drawing ink have very stubby points. Easier to see when filling an inking pen or compass if end is cut to a sharper angle, as in dotted lines of Fig. 7.

A pencil eraser is easily soiled and must be cleansed after a few erasures. This is done by rubbing end of eraser over rough surface. Sandpaper is sometimes used for this purpose, but as sand loosens it imbeds itself in rubber, and this scratches the drawing. A useful kink for cleaning an eraser is the wood block fastened under the drawing-board in Fig. 8. A number of narrow slits are sawed in end of block with hacksaw. Each slit is cut at angle of 15 degrees. If end of eraser is rubbed in a horizontal direction across front of block the dirt is sheared off.

Blueprints and drawings are often rolled up. It is then necessary to roll them outward a few times in order to make them lie flat. If one end of paper is pulled over edge of filing cabinet or table, and then drawn downward with hand, while topside is held down with the other hand and arm, as in sketch at Fig. 9, the drawing will lie flat.

Above extracts are from an article in "Machinery" by James E. Cooley. On Fig. 4 it seems doubtful if the kink adds much stability to the common pencil whose flat sides are expected to keep it wherever placed. A much more saving scheme than cutting

up old pencil stubs to serve as compass leads is to throw away the stubs and buy the leads made for that purpose.

MACHINERY BELTS, ROPES AND CHAINS

Fencing off the shafting, belt breaks lessened by inspection, pointers on fences, degrees of danger and interference with the processes of manufacturing, and peculiarities of ropes and chains as well as belts

WHERE the shafting is high enough to allow passage underneath, but is less say than 6½ feet from the floor level, the shaft should be completely incased at the passageway as is shown by the two views seen in Fig. 1. These indicate how rotating parts can be safely fenced.

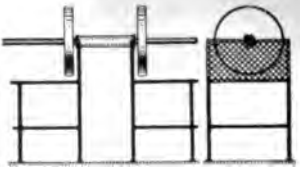


Fig. 1. Fenced Shafting with Guarded Passageway

Fig. 2. Guard of Expanded Metal for Overhead Belt

This protection must be carefully weighed in connection with belting. Heavy overhead belts which may never be approached while in motion and to that extent are safe by position may properly require some safeguard in case of breakage. Systematic examination of belts lessens number of breaks.

Belts passing through floor should be fenced ound about 4 feet high. If belts run at any angle ay be necessary to increase the height of guard v 6½ feet on underside of belt to prevent ntal contact.

This is Why Millmen Insist on DISSTON SAWS

Here is a steel wedge that was driven into a log and forgotten.

The log in due course arrived at the mill of the Girard Lumber Company, at Dunbar, Wisconsin, U. S. A. This mill is equipped with Disston Saws, and one of these—a 17-gauge, on a Twin Band Mill—while passing through the log, encountered the steel wedge.

It cut clear through the wedge as shown in the illustration, and the filer at this mill reports that the saw lost only 1-32 of an inch as a result of the accident. It took him one and a half hours to get the saw ready to resume its regular run.

We do not claim that a Disston Band Saw will cut metal, but we do claim that when steel meets steel the superior quality and temper of a Disston Saw will triumph every time, for this is only one of many similar incidents.

HENRY DISSTON & SONS

INCORPORATED

Keystone Saw, Tool, Steel and File Works

PHILADELPHIA, U. S. A.

Substantial guards under heavy overhead belts may be troughs of wood, sheet-metal, perforated or expanded metal, strongly constructed and firmly supported by walls or beams as in Fig. 2.

Guards under the overhead belts may be of ladder-like type made of angle irons fitted with metal rungs as in Fig. 3. They can be made of strong bow-shaped iron cleats as in Fig. 4. Both the constructions shown in Figs. 3 and 4 are efficient and will

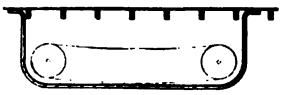


Fig. 3. Ladder-type Guard for Overhead Belt

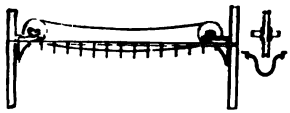


Fig. 4. Guard of Bow-shaped Iron Cleats for Rope

not interfere with an examination of a belt or rope as these are always in sight.

But if there are projecting fasteners on belt, or should latter separate at joint, there is plenty of room for trouble between the rungs of these open-work fences in Figs. 3 and 4 whenever the projecting corners come in contact where they don't belong.

Much judgment and experience are necessary in fencing belts. Necessity for fencing depends upon belt position, size, speed, or special circumstances. Each case is to be considered on its own merits as to degree of danger and the nature of fencing required. Latter calls for minimum interference with manufacturing processes, efficiency as a guard, and freedom of access in the event of repairs or alteration.

Ropes do not break without showing signs of wear. In this they are unlike belts which in general

A Whitney is the Answer

To Every Planing Problem

No matter what kind of lumber you plane, seven widths of Single Surfacers and seven widths of Double Surfacers enable you to select the particular sized Whitney Planer best suited to your requirements.

And it can be either Belt Driven or Direct Motor Driven, without belts.

You obtain in a Whitney Planer all that superior skill, experience and highly-specialized ability can give toward the production of a planing machine that you can depend upon—as no other—to produce greatest volume and smoothest planing at lowest possible cost.

Tell us what kind of surfacing you do—we will make suggestions as to the means of equipping your Whitney Planer especially for your work with square cylinders carrying two or four knives or round cylinders and four thin high speed steel knives, sectional rolls and steel sectional chip breakers or flexible steel chip breakers and jointing, grinding and setting devices.

——*WRITE*——

BAXTER D. WHITNEY & SON

WINCHENDON, MASS.

California Office, Berkeley, California
North Pacific Coast Office, Stetson-Ross Mach. Wks., Seattle, Wash.

Selling Representatives

Chicago Machinery Exchange, 1219-27 Washington Blvd., Chicago, Ill.
Wysong & Miles Co., Greensboro, N. C., Agents for Virginia
North and South Carolina, Georgia, Florida and Eastern Tennessee

break unexpectedly. Low sagging ropes in passages need to be guarded by troughs. Outdoors the low sagging rope may sway from wind pressure and this needs prompt attention.

Driving chains running over sprockets are as dangerous as gears. At the intake side in particular they should have guards wherever they are accessible and it is always well worth while to consider their complete inclosure.

SUNDRY SORTS OF CEDARS

WHAT is called "cedar" is not at all the cedars used by Solomon in the building of his temple at Jerusalem, nor the famed wood preferred by the Egyptian woodworkers. Of the Solomon cedars there exist only about 300 trees, which are carefully fenced in and guarded, and which serve merely as a place of pilgrimage and for tourists.

Common so-called cedar is far from the scented, brownish-red real cedar, and has only the name in common with that tree. The Himalayan cedar growing at heights of 4,000 to 20,000 feet above sea level is the nearest relative to the cedar of Lebanon, and is used a great deal in English shops.

Similar to this cedar is the West Indian or Spanish cedar which is used for cigarboxes. As this supply is getting scarce, substitutes have been found in the African Bosipi and the wild muscat-tree, as also our American juniper-tree, which, however, is also becoming rare. Japanese cedar wood is light, soft and durable.

Year book of the Merchants' Association of the City of New York shows a big array of membership ssified into 157 divisions.

Carborundum Brand Garnet Paper Discs

THERE is nothing new we can tell you about the certain advantages of using a disc machine — but we *can* tell you how to get more work out — better work — and in less time — equip them with Carborundum Brand Garnet Paper Discs — faster cutting — cleaner cutting — they last longer and give a better finish. — Made in any desired diameter or grit — every disc accurately cut — uniformly coated with clean sharp garnet — and the grain stays on.

There is more to be learned by a trial.

The Carborundum Company

Niagara Falls, N. Y.

New York **Boston** **Chicago**
Philadelphia **Cincinnati** **Cleveland**
Grand Rapids **Milwaukee**
Pittsburgh **London, Eng.**

METHODS FOR THE DRYING OF VENEERS

Defects in veneer and their causes, explains why a lot of work went wrong, frills and whiskers, placing responsibility for trouble, and other practical kinks

AT the Chicago meeting of the National Veneer and Panel Manufacturers' Association a paper on lumber and veneer drying was presented by Albert Kraetzer, of Chicago, from which the following abstract has been made:

A new Southern veneer mill had four or five "rotaries," as the foreman called them. They had a log about 30 inches in diameter in one of the "lathes," as I called them, and 1/20-inch veneer was uncoiling. The veneer was bright, pretty and flat, but instinctively I made for the storage-room to see what it looked like when dry. The proper remedy with defects is to first acertain that there are defects, and then go backward to determine at what stage of manufacture these defects originated.

I found defects. Twist, curl and warp galore! But the greatest surprise was in the 1/20-inch. This had ruffles on the ends. Ends of the veneer had dried faster than the other portions because exposed when sheets were stacked, and as main body of sheets had not shrunk until ends were dry, the ends had to dry while they were held in distended shape. Before the center had shrunk the ends had set in width. Later on the center, drying more slowly, had also shrunk more than ends, and as the ends could not shrink after they were dry, they had to curl up into ruffles.

The remedy lay in either shrinking the ruffled ends as much as center, or to dry the center as fast as ends and thereby prevent some of the excessive shrinkage of center.

Made by the oldest concern
with the fullest guarantee
write for information
LORING COES & CO. INC.
WORCESTER MASS., U.S.A

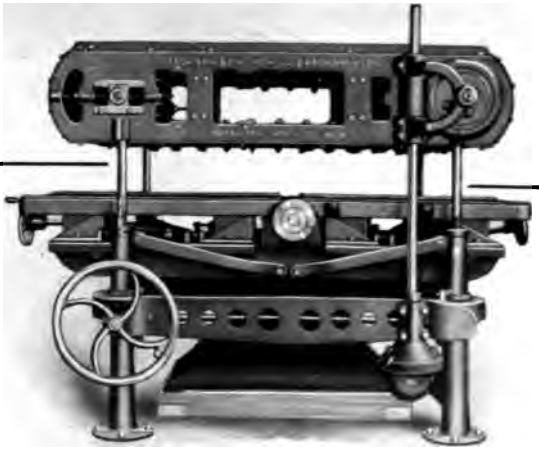
First thing I encountered in drying-room was "whiskers," otherwise fungus, or mold. Fungous growth is a sure indication of stagnant air.

The veneer from the trimming-room, where it had been cut to size, was fed on endless chains into sheet-iron ovens. All these 1/20-inch veneers made at least one round-trip through ovens, and I noticed the tendency toward ruffles before veneer was started on its first round-trip through drier. After the first round-trip the ruffles began to show, and after the second they were present in full effulgence.

I got from operator the answer: "This machine is no good. We have tried everything." That really does not mean anything, unless "we have tried everything we know." The fault was not with the drier, but with the material.

The veneer as it came from rotary was not "smoking." Log was not hot enough. Everybody who has steamed lumber under pressure for bending purposes, or otherwise, notices that the surface to a depth of from 1/32 to 1/16 inch gives up its moisture almost immediately after exposure to air capable of taking up this moisture. Apply this 1/20 veneer and see where 2/32 will land. The veneer as it came from this rotary was not giving up excess moisture because it was not hot enough—was not smoking enough to give up moisture.

Boys were rolling up this veneer into coils just contrary to what ought to be done for drying it. After a time men unrolled these coils onto tables at had solid tops and rapidly cut up the long sheets o regular sizes and stacked them solid. Air in n was stagnant and charged with humidity—contrary to what it ought to be. All these con-



The Herzog Automatic Jointer Feeder

Perfect Safety — Maximum Efficiency

THE type shown is for surfacing only; another style swings out to allow jointing and miscellaneous work. **The Herzog Jointer Attachment** has a traveling feed bed fitted with numerous elastic pressure fingers, pressing firmly and evenly on all portions of stock. The upper part of this bed returns to the front all boards incompletely surfaced.

It does better work than the most skillful hand operator and accomplishes from three to four times as much.

Can be set to take out all the wind, or to surface and take out only part or none of the wind.

Will handle stock thick or thin, long or short, wide or narrow, without adjustment or care. Blocks as short as 3 in. are surfaced successfully.

Used by manufacturers of furniture, cabinets, pianos, caskets, refrigerators, toys, sash and doors, etc.

Sent on Thirty Days' Trial.

JACKSON & CHURCH COMPANY

SAGINAW, MICH.

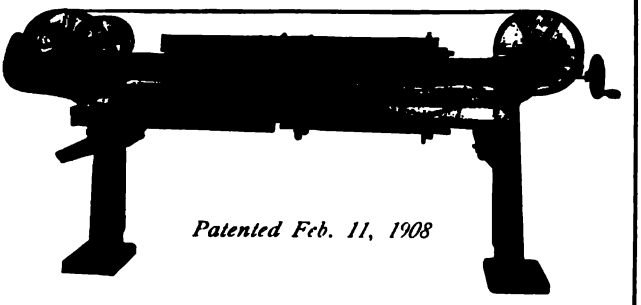
ditions retarded the drying instead of assisting it. To cap it all, a respectable supply of logs was cooling off back of rotaries so that no time might be lost waiting for a hot log.

At the boiling vats was trouble. Here were a number of concrete vats with a warm brownish liquid in them floating a lot of logs immersed for about three-fourths of their bulk. Several men were parading up and down poking these logs under the surface and turning them so that the whole log could be subjected to the boiling process. Man in charge told me that temperature of the water ranged from 180 to 200 degrees. The system was a messy and smelly affair, and did not boil the logs—212 is the boiling point, and I am sure the veneer as it came from log was not over 150.

From time that log was first immersed in hot bath until the bulked sheets arrived in front of drier, every possible precaution for preventing evaporation of moisture was taken and then—"this machine is no good."

A gentleman connected with a big veneer industry in Russia visited us. It developed that his company prepares its logs for the machines by first steaming them under a pressure of fifteen pounds for from five to ten hours, depending upon thickness of logs. This produces a temperature of 250 degrees clear through logs. He said that when logs are placed in lathes they are considerably hotter than any that he had seen in the United States; that when the veneer was being cut it was hot enough to give off its moisture very rapidly, and that as a result of this quick drying the veneer was being manufactured into "ply-wood," as he called it, without subsequent drying.

Our Twentieth Century
BELT SANDER



Patented Feb. 11, 1908

PERFECTION IN ITSELF

Will do double the amount of work of a hand block machine and do it better and easier.

Complete Control ***Only One Lever***

enables the operator to sand his work at any point, as much or as little as he pleases, without changing his position.

OUR SPECIALTY IS

RUBBING AND POLISHING MACHINES
BELT SANDERS
DOUBLE MITRE SAWS

Write for circulars to

Maddox Machine Company

Jamestown, N. Y.

This is logical. The ruffles prove it, for ends of the veneer had dried more or less even under adverse conditions and did not shrink in drier. If they had there would have been no ruffles.

Now then: Raise temperature of logs to 250 degrees. By subjecting them to steam under a pressure of fifteen pounds, five to ten hours will accomplish this.

Do not take log out of steam until lathe is ready for it.

Have plenty of ventilation in the veneer-cutting room. If you cannot get it by opening doors and windows and putting ventilators in the roof, move your air in the same manner that air is moved in buildings that are artificially ventilated. Especially keep warm air moving over the veneer log and where the veneer leaves it.

If you possibly can, do not pile your cut sizes in bulk; put separators or stickers between them.

Do not introduce veneers into drying machines until the solid body of moisture, at least, has been dissipated. By the time 1/20 veneer has arrived in front of drier it ought to be practically air-dried and drier, instead of putting kinks into veneer, ought to take them out.

About 45 billion feet of lumber of all kinds in the annual production in the United States; of this nearly 25 billion feet, board measure, are further manufactured, the other portion remaining for rough construction lumber, etc. This does not include at material going into fuel, railroad ties, posts, es, pulpwood, cooperage, wood distillates, and barks and extracts for tanning.

Emery Wheel for Saw Gumming and General Grinding Purposes
Leather Wheel for Stropping and finishing the tools
Emery or Grinding Cone for grinding gouges, curved cutters etc.
Fine Oilstone for finishing and putting smooth, keen edges
Coarse Oilstone for Rapid Grinding
Contentment
Satisfaction
Longer life for tools
FIVE
Original Features
covered by
Mummert-Dixon
Oilstone Grinders
MUMMERT-DIXON CO.
HANOVER, PA.

Aug. 12, 1890
Feb. 10, 1891
Mar. 28, 1891
April 12, 1891
April 25, 1893

New Patent Issued March 4, 1913

We are in a position to furnish you these guides at the same price you can buy the imitation, ***and further, furnish you a guide which we can guc***

Send us your orders direct for ***Ga***
Duplicate parts always carried in s

WHAT IS THIS?

A Systematizer of the glueroom, some call it. Others say it is a **Common Sense Drier** for Crossbanding and Veneer.

IT IS BOTH!

If we give it away? No, not quite, but we sell it to reputable manufacturers on a blanket guarantee to turn out flat and bone dry crossbanding and veneer quicker and better than is possible in any other way.

Of course, you can get along without. You have done so, your father and your grandfather, perhaps, but maybe it would pay for itself in 15 to 18 months and do away with all your troubles, if you have any in your glueroom.

Tear this out and mail it to

"MERIT," - Lockport, N. Y.

Fare $3.00

——DAILY BETWEEN——

Cleveland and Buffalo

THE GREAT SHIP "SEEANDBEE"

Length 500 feet; breadth 98 feet, 6 inches: 510 staterooms and parlors accommodating 1500 passengers. Greater in cost—larger in all proportions—richer in all appointments—than any steamer on inland waters of the world. In service June 15th.

Magnificent Steamers "SEEANDBEE," "City of Erie" and "City of Buffalo"

Daily—CLEVELAND and BUFFALO—May 1st to Dec. 1st

Leave Cleveland -	8:00 P. M.	Leave Buffalo -	8:00 P. M.
Arrive Buffalo - -	6:30 A. M.	Arrive Cleveland	6:30 A. M.
	(Central Standard Time)		

Connections at Buffalo for Niagara Falls and all Eastern and Canadian Points. Railroad tickets reading between Cleveland and Buffalo are good for transportation on our steamers. Ask your ticket agent for tickets via C. & B. Line. Write us for handsome illustrated booklet free.

THE CLEVELAND & BUFFALO TRANSIT CO., Cleveland, O.

TO get the maximum capacity from your Continuous Feed Jointer, you should fit it with the Genuine Morris Wood & Sons 20th Century Solid Steel Guaranteed Glue Joint Cutters.

These cutters will be furnished on your new Jointer if you insist upon it. *Our Guarantee:* Better cutters have never been produced. Our thirty-eight years of cutter-making reputation back this guarantee. Can you beat it? Better get a line on our prices.

Write now for Circular W. C.
It tells all about them.

MORRIS WOOD & SONS

5108-5110 W. Lake St. CHICAGO, ILL.

THE COAST LINE TO

MACKINAC

DETROIT, CLEVELAND, BUFFALO, NIAGARA FALLS.

TOLEDO, PT. HURON, ALPENA, ST. IGNACE.

"THE LAKES ARE CALLING YOU"

ARRANGE your vacation or business trip to include our palatial lake steamers. Every detail that counts for your convenience and comfort has been provided.

Daily service between Detroit and Cleveland, and Detroit and Buffalo. Day trips between Detroit and Cleveland during July and August. Four trips weekly from Toledo and Detroit to Mackinac Island and way ports. Special Steamer Cleveland to Mackinac Island two trips weekly June 25th to September 10th, making no stops enroute except at Detroit every trip. Daily service between Toledo and Put-in-Bay June 10th to September 10th.

Railroad tickets accepted for transportation on D. & C. Line steamers in either direction between Detroit and Buffalo or Detroit and Cleveland.

Send two-cent stamp for illustrated pamphlet giving detailed description of various trips. Address L. G. Lewis, General Passenger Agent, Detroit, Mich.

Detroit & Cleveland Navigation Company

Philip H. McMillan, *President.*
A. A. Schantz, *Vice Pres. and Genl. Mgr.*

HOLMES
No. 68½
CUT-OFF SAWS

This HOLMES SWING CUT-OFF SAW is so compact that it will fit into practically any space in your shop.

It is easily changed to either right or left hand and may be operated by foot or by hand.

It will handle stock of practically any size.

Don't carry your stock to the saw when you can put a HOLMES saw where you need it.

WRITE US FOR PRICES

E. & B. HOLMES MACHINERY CO.

33 Chicago St. **BUFFALO, N. Y.**

THE ALLINGTON & CURTIS MFG. CO.

Manufacturers of

Slow Speed
Low Power
SHAVINGS & DUST COLLECTING SYSTEMS

You Can Save Power
by having us install
one of these systems for you

CHICAGO SAGINAW, MICH. SO. BOSTON

SEND FOR SAMPLES

OF OUR

No. 7064 BROWN MAHOGANY
No. 7008 FUMED ACID STAIN
EARLY ENGLISH STAIN

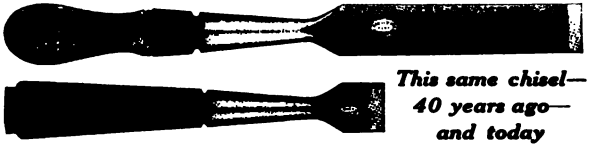
THESE are the three most popular finishes with the furniture and cabinet maker today.

Full directions for use sent with samples.

Also ask us for prices on Acetone—Amyl Acetate—Benzole—King Turpentine—Oil Soluble Colors—Water Soluble Colors—Spirit Soluble Colors—Creosote Oil—Acids, Commercially and Chemically Pure—Cyanide Potash—Bichromate Potash—Polishing Waxes—Cement Sticks—Orange Shellac.

WALTER K. SCHMIDT COMPANY

306-308 Monroe Ave. - - GRAND RAPIDS, MICH.



This same chisel—40 years ago—and today

It Took 40 Years to Wear Down This Chisel

and it is giving as satisfactory service today as when first bought.

BARTON EDGE TOOLS

are made even better today than they were 40 years ago.

Specify them. If your hardware dealer should be unable to supply you, send to us for a catalog and our free Story Book entitled "True Stories." It is worth your reading.

MACK & COMPANY

Brown's Race near Platt St. ***ROCHESTER, N. Y.***

THE

WEATHERLY

INDIVIDUAL

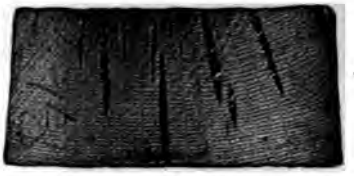
Glue Heater

Send your address and receive descriptive circular of Glue Heaters, Glue Cookers and Hot Boxes with prices.

The Weatherly Co.

Grand Rapids, - Mich.

Extensively used by the Grand Rapids furniture workers.

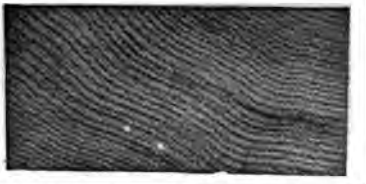


BEFORE USING

Grand Rapids Dry Kiln

Grand Rapids, Mich.

AFTER USING



IT TAKES GOOD TOOLS TO DO GOOD WORK and

The BEST BENCH IN the COUNTRY IS CHRISTIANSEN'S

It costs no more than a poor bench and will wear ten times longer.

Tell Your Hardware Dealer that

You Want a Christiansen Bench

C. CHRISTIANSEN, 2225 Grand Avenue, Chicago, Ill.

ENCHES - TOOL CHESTS - HAND SCREWS

"ANDREWS" Dried Lumber
is Better Lumber

"ANDREWS" Products Represent
Perfection—Reliability—Results

"Andrews"
MOIST AIR
Lumber
Driers

Condensing
— OR —
Ventilated

Perfect Transfer Cars

Perfect Dry Kiln Trucks

Canvas Dry Kiln Doors
DOUBLE AND SINGLE

Write for Information

DRIER DEPARTMENT
THE A. H. ANDREWS CO.
115-117 South Wabash Avenue - CHICAGO

WE HAVE BEEN MAKING THE

Best French Glue in the World

SINCE 1818; ALMOST A CENTURY

In competition at the numerous Expositions abroad, the quality of our glues has been found so high, that we are usually declared "Beyond Competition." Our trade in this country makes the same declaration. Consistency in quality and service has brought this result and we are proud of it.

Perfection in manufacture from the best raw material makes the quality of COIGNET FRENCH GLUES consistently the highest.

Large stocks at convenient points throughout this country assure the best of service.

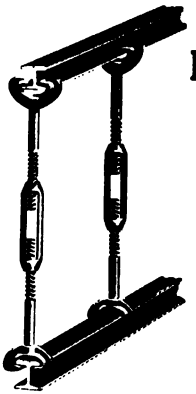
Why not take advantage of these most important factors, by using our glues?

At your service for prices and samples.

COIGNET & COMPANY

17 STATE STREET N. Y. CITY, N. Y.

Factories at { St. Denis / Lyons } France



SINGLE BEAM RETAINING CLAMPS

A mighty good thing for Hand Screw and other Veneer Presses, and practically invaluable for the Hydraulic Press. They are strong and durable, save fully half your time, and adjust quickly to different widths.

No. 1 for stock up to 18" wide
No. 2 for stock up to 24" wide
No. 3 for stock up to 30" wide
No. 4 for stock up to 36" wide
And larger sizes.

State daylight of your press and Clamp Rods will be made accordingly.

ORDER A SAMPLE LOT NOW

Everyone who tries buys a full equipment: There is a reason.

CHAS. E. FRANCIS CO. - Rushville, Indiana

Specialty Manufacturers Glue Room Equipment

This is Something You Want!

IT will prevent you from making financial losses, also assist you in securing new customers.

THE RED BOOK

is published semi-annually in February and August.

It contains a carefully prepared list of the buyers of lumber in car lots, both among the dealers and manufacturers.

The book indicates their financial standing and manner of meeting obligations. Covers the UNITED STATES, ALBERTA, MANITOBA and SASKATCHEWAN.

The trade recognizes this book as the authority on the lines it covers.

A well organized Collection Department is also operated and the same is open to you.

Write for Terms.

Lumbermen's Credit Association

ESTABLISHED 1876

608 So. Dearborn St. CHICAGO — MENTION THIS PAPER — **110 Nassau St. NEW YORK CITY**

THE LONG BROAD JAW OF THE
UNIVERSAL CLAMP

makes it particularly adapted for all kinds of veneering and paneling work.

Our catalog No. 252 will give you complete description, sizes, and further information as to its time saving and quick acting features.

Send for your copy today

BATAVIA CLAMP CO.

165 Center Street Batavia, N. Y., U. S. A.

The Best Groover or Dado Heads in America are
COCKER'S

Sizes ⅛" to 2" or more in width.

YOU will also find the Cocker Shingle, heading, concave, resaws and chisel-tooth saws to be the best on the market. We make knives of every description. They are fully guaranteed.

Write us for prices and complete description

THE COCKER MFG. COMPANY

85 Market Street : Lockport, N. Y

Send for Catalog No. 60 Today

Band Saws, Jointers, Saw Tables, Swing Saws—tools of good, honest construction, newest improvements and conveniences; patterns fresh from the designers.

Jointers—8, 12, 16, 20, 24-in.

Band Saws—20, 26, 32, 36-in.

Swing Saws—6½, 7, 7½ and 8 foot.

Saw Tables—two styles.

Get our catalog No. 60 at once

The Silver Manufacturing Co.

345 Broadway, Salem, Ohio

The Ackley Finger Saver

THIS saw guard absolutely prevents accidents. It enables your operator to work without fear or danger. As a result of this, he can do more work than without this guard. It is small, compact, and can be taken off instantly, if desired.

The price of this saw guard is so low it will pay you to immediately investigate it.

Buy one for your plant. We will send you one of these Ackley Finger Savers subject to your approval.

Write us for one today on this basis.

C. O. Porter Machinery Co.

0 Front Ave., GRAND RAPIDS, MICH.

There is a **Crescent Saw Table** for your particular use—Each

CRESCENT SAW TABLE

is complete with saw, belt, belt shifter, mandrel wrench, ripping fence, cut-off fence, everything complete ready to belt to your line shaft. Built in five sizes. You may have one or two mandrels. We build one machine with sliding top.

Ask today for our catalog giving complete description of **CRESCENT** Saw Tables, Band Saws, Planers, Planers and Matchers, Disk Grinders, Swing Cut off Saws, Shapers, Borers.

THE CRESCENT MACHINE CO.

220 Main Street - - - - - - **Leetonia, Ohio**

No. 9

Automatic Self Feed

SLASHER or CUT-OFF SAW

Cuts stock from two to twenty-two inches wide any angle up to 45°.

Works by foot control, leaving both hands of the operator entirely free to handle the stock.

Especially designed for doors, sashes, blinds, furniture, boxes, etc.

Ask us for a booklet and mention *Wood Craft* when you write.

Fischer Machine Works

1841-45 Carroll Ave. **CHICAGO, ILL.**

The MEETING PLACE of Employer & Employee

Advertisements under this heading FIVE CENTS PER WORD. Copy must be received not later than the 20th of the month preceding date of issue. If you do not find what you require, let us help you.

POSITION WANTED—In woodworking factory, by experienced superintendent or foreman of recognized ability and character. Practical mechanic, expert on factory organization, cost keeping, modern manufacturing methods. Address Box 305, care Wood Craft, Cleveland, O.

WANTED—FOREMAN WANTS POSITION. HAS BEEN foreman in shops for ten years; experienced in interior housework, bank, store and office fixtures, also furniture. References first class. Address Box 306, care Wood Craft, Cleveland, Ohio.

FOR SALE—44-INCH LEFT HAND McDONOUGH RE-saw. But slightly used. At a bargain if taken at once. Also one Greenlee all iron sash clamp. Address Paul O. Moratz, Bloomington, Illinois.

WILBUR R. SMITH

Industrial Engineering

Woodworking plants, box factories a specialty

609 E. 17th St., Alton, Ill.

MANUFACTURING IN CANADA

American manufacturers, contemplating the establishment of a factory in Canada, will save time by consulting us. We have complete detailed information on every commercial city, shipping facilities, power rates, raw materials, labor conditions, details of vacant factories, inducements, etc.

Dep't F, Heaton's Agency. **Toronto, Ontario, Canada**

A GOOD PROPOSITION

Complete woodworking plant just built and equipped, up-to-date in every respect; suitable for any furniture manufacturer or woodenware specialty or vehicle bodies. Sawmill adjacent for special cut stock. Low power rate, good railroad facilities. Will lease on cash or percentage basis with privilege of purchase. A good proposition to the man with cash for operating expenses. Address

Commercial Association. **Crawfordsville, Indiana.**

WILLIAM H. SNYDER

General Sales Agent

Rotary cut gum box shooks, etc.
Dimension oak and hickory lumber.
Three-ply panels, door stock, crossbanding, drawer bottoms, etc.

Submit your specifications for prices.

838 Jefferson Ave. **Indianapolis, Ind.**

GERLACH

Circular, Band and Cylinder Saws

New Roller Saw Swage and Sharpeners

Are unexcelled in Europe or America. We use the best steel, the finest equipment, and have sixty years behind us.

The Peter Gerlach Company. **Cleveland, Sixth City.**

FREE SITE FOR BOX FACTORY

Liberal inducements to right parties. Water front. Right in the center of box wood territory. Write to

James H. McDonald,

Secy. Land & Power Co. **Rapid River, Mich.**

RIPSAWS

Ten boxmakers' hand-feed ripsaws, wood frames, iron tops, counters and fences, good order; to close out $15.00 each. Apply at once before it is too late.

Woodward Machinery Co. **514 Main St., Cincinnati, O.**

TENANT FOR WOODWORKING PLANT

Fine plant on railroad siding, considerable modern machinery, vacant. City wants industries. This is ready for operation by live concern. Full particulars on request.

Industrial Commission. **Ithaca, N**

MACHINERY SECTION

Lists of Second-hand Machinery, for Sale or Wanted, will be published in this department at the rate of 35 CENTS A LINE each issue (nine words to the line). Name and address are not counted in the space charged for. Copy must be received not later than the 20th of the month preceding date of issue.

FOR SALE

Lathe mill and bolter combined, Frisby, nearly new, $100.
Mortiser, No. 3 Smith, $100.
Moulder, 6-in., 1-side, Smith, $70.
Moulder, 6-in., 2-side, Smith, $75.
Moulder, 7-in., 4-side, Powers, nearly new, $225.
Moulder, 9-in., 4-side, Houston, $300.
Moulder, 12-in., 4-side, American, $600.
Moulder, 12-in., 4-side, Woods' inside, $250.
Planer and matcher, No. 44 Berlin, 9 x 6 in., $425.
Planer and matcher, Fay, 24 x 6 in., heavy, $400.
Resaw, band, American, 48-in. wheel, $600.
Resaw, circular, 42-in., $200.
Sawmill, band, 63-in. wheel, carriage 18 ft., $750.
Shaper, Indiana, 2-spindle, $110.
36-in. Buss double surfacer, thoroughly overhauled, $350.
Tenoner, Houston, double head and 2 copes, $175.
Tenoner, Hall & Brown, double head, 2 copes and cut-off saw, $140.

Badger-Packard Machinery Co.

74-76 W. Water St. **Milwaukee, Wis.**

BAND SAWS CRACKING?

Overcome it and cut 10 per cent more and better lumber. A card gets convincing testimonials. Five minutes work. No change whatever in fitting. Run tension closer to edge and more of it. Price $2 with sample section of tooth. Your money back if not satisfactory.

Band saw templets; six hair line templets on a 14-in. templet, 14-gage piece; one edge straight, the other 45 in. Make your own gages from it, concave or convex, 25, 30, 40, 45 and 1-circle. Price $2.

These templets and instructions on overcoming band saw ks, in one order, $3.

Miner. **Lumberton, Miss.**

REBUILT, TESTED AND GUARANTEED SECOND-HAND MACHINERY

Band saw, 36 in., with iron tilting table.
Boring machines, double and single.
Cabinet makers' benches, only a few left.
Glue spreader, 61-in., double, late pattern.
Glue heaters, several styles and sizes.
Hand planer, 24-in., modern tool, long tables.
Moulder, 7-in., 4-side, good make, powerful feed.
Mitering machine, large one on stand.
Rip saws, iron and wood frames.
Surfaces, 24 x 7 in., 26 x 6 in., 28 x 6 in., 32 x 8 in., single.
Shapers, double and single spindle.
Swing saws, three different kinds.
Sanders, 42 and 48 in., 3-drum, late type machines.
Tenoners, heavy double and single end, double heads.
Veneer presses, 12 x 32 in., 9 x 38 in. and 13 x 50 in., sectional type.

Mail us a list of your wants.

The John T. Towsley Mfg. Co.

Builders of Modern Woodworking Machinery, Gluing Appliances, Factory and Lumber Trucks.

1100 Evans St. **Cincinnati, Ohio.**

FOR SALE

Used Woodworking Machinery

Band saw, West Side Iron Works, 36 in.; Lehman, 30 in.
Borers, 2 Andrew single-spindle, vertical.
Borer, M. L. Andrew 30-in. vertical, 4-spindle.
Borer, Bentel & Margedant, 2-spindle, hor. 1 to 6 in.
Dovetailers, Dodds', 9-, 12- and 24-spindle.
Edger, Fay & Egan, wood frame 10 ft.
Grinders, knife, B. T. & B. 44-in., Rogers 44-in.
Jointers, Buss 8-in., G. & K. 16-in., Cordesman 24-in., Lehman 12-in.
Jointer, B. & M. 30-in. with power feed.
Moulders, 6-, 7-, 8-, 10- and 12-in. outside.
Planers, Clement 20-in. and 26-in., B. & M. 24-in.
Planers, single cabinet, Buss 30-in., 2 Dennis 30-in.
Planers, 2 American No. 4½, 24-in. single.
Sander, Mattison No. 111, belt.
Sash sticker, Fay & Co., with P. & B. attachment.
Saws, tilting table, American No. 1, Egan Co.
Saw, heavy rip, Fay & Egan, for 30-in saw.
Saw, Rowley & Hermance combination saw and dado.
Saws, wood frame, rip and cut-off.
Shapers, double-spindle, Indiana.
Tenoners, J. A. Fay & Co., W. R. & R. wood frame.

The Chas. A. Strelinger Co.

Woodworking Dept. **96-110 Bates St., Det**

MACHINERY SECTION

Lists of Second-hand Machinery, for Sale or Wanted, will be published in this department at the rate of 35 CENTS A LINE each issue (nine words to the line). Name and address are not counted in the space charged for. Copy must be received not later than the 20th of the month preceding date of issue.

FOR SALE

Lathe mill and bolter combined, Frisby, nearly new, $100.
Mortiser, No. 3 Smith, $100.
Moulder, 6-in., 1-side, Smith, $70.
Moulder, 6-in., 2-side, Smith, $75.
Moulder, 7-in., 4-side, Powers, nearly new, $225.
Moulder, 9-in., 4-side, Houston, $300.
Moulder, 12-in., 4-side, American, $600.
Moulder, 12-in., 4-side, Woods' inside, $250.
Planer and matcher, No. 44 Berlin, 9 x 6 in., $425.
Planer and matcher, Fay, 24 x 6 in., heavy, $400.
Resaw, band, American, 48-in. wheel, $600.
Resaw, circular, 42-in., $200.
Sawmill, band, 63-in. wheel, carriage 18 ft., $750.
Shaper, Indiana, 2-spindle, $110.
36-in. Buss double surfacer, thoroughly overhauled, $350.
Tenoner, Houston, double head and 2 copes, $175.
Tenoner, Hall & Brown, double head, 2 copes and cut-off saw, $140.

Badger-Packard Machinery Co.

74-76 W. Water St. **Milwaukee, Wis.**

BAND SAWS CRACKING?

Overcome it and cut 10 per cent more and better lumber. A card gets convincing testimonials. Five minutes work. No change whatever in fitting. Run tension closer to edge and more of it. Price $2 with sample section of tooth. Your money back if not satisfactory.

Band saw templets; six hair line templets on a 14-in. templet, 14-gage piece; one edge straight, the other 45 in. Make your own gages from it, concave or convex, 25, 30, 40, 45 and 50-circle. Price $2.

These templets and instructions on overcoming band saw racks, in one order, $3.

H. Miner. **Lumberton, Miss.**

REBUILT, TESTED AND GUARANTEED SECOND-HAND MACHINERY

Band saw, 36 in., with iron tilting table.
Boring machines, double and single.
Cabinet makers' benches, only a few left.
Glue spreader, 61-in., double, late pattern.
Glue heaters, several styles and sizes.
Hand planer, 24-in., modern tool, long tables.
Moulder, 7-in., 4-side, good make, powerful feed.
Mitering machine, large one on stand.
Rip saws, iron and wood frames.
Surfaces, 24 x 7 in., 26 x 6 in., 28 x 6 in., 32 x 8 in., single.
Shapers, double and single spindle.
Swing saws, three different kinds.
Sanders, 42 and 48 in., 3-drum, late type machines.
Tenoners, heavy double and single end, double heads.
Veneer presses, 12 x 32 in., 9 x 38 in. and 13 x 50 in., sectional type.

Mail us a list of your wants.

The John T. Towsley Mfg. Co.

Builders of Modern Woodworking Machinery, Gluing Appliances, Factory and Lumber Trucks.

1100 Evans St. **Cincinnati, Ohio.**

FOR SALE

Used Woodworking Machinery

Band saw, West Side Iron Works, 36 in.; Lehman, 30 in.
Borers, 2 Andrew single-spindle, vertical.
Borer, M. L. Andrew 30-in. vertical, 4-spindle.
Borer, Bentel & Margedant, 2-spindle, hor. 1 to 6 in.
Dovetailers, Dodds', 9-, 12- and 24-spindle.
Edger, Fay & Egan, wood frame 10 ft.
Grinders, knife, B. T. & B. 44-in., Rogers 44-in.
Jointers, Buss [illegible]-in., G. & K. [illegible]-in., Cordesman [illegible]-in., Lehman 12-in.
Jointer, B. & M. 30-in. with power feed.
Moulders, 6-, 7-, 8-, [illegible]- and [illegible]-in. outside.
Planers, Clement [illegible]-in. and [illegible]-in., B. & M. 24-in.
Planers, single cabinet, Buss [illegible]-in., 2 [illegible]
Planers, 2 American No. 4½, 24-in. single.
Sander, Mattison No. [illegible]
Sash sticker, Fay & Co., with [illegible] & B. [illegible]
Saws, tilting table, American No. [illegible]
Saw, heavy rip, Fay & Egan, for [illegible]-in. saw
Saw, Rowley & Hermance [illegible] saw and [illegible]
Saws, wood frame, [illegible]
Shapers, double-spindle, [illegible]
Tenoners, J. A. Fay & Co., W. R. & R. wood frame.

The Chas. A. Strelinger Co.

Woodworking Dept. **96-110 Bates St., Detroit.**

WAYNE MACHINERY COMPANY.

Taylor St. **Fort Wayne, Ind.**

Successors by Purchase Hanna-Brackenridge Co.

On our own wareroom floors we carry the largest and best **selected stock k**nown.

We furnish all machines under plan which will appeal to **you because it** is fair and in keeping with good business policy.

Our claims are reasonable.

Our policy is simply a **square deal.**

The following are only single surfacers in stock. We have all **other m**achines in about the same proportion.

1—16 x 5 **J. A. F**ay & Co. pony planer.
1—18 x 6 **Rowley** & Hermance pony planer.
1—24 x 6 **Holmes** pony planer.
1—24 x 6 **Hobbs** pony planer.
1—24 x 6 **Frank** & Co. pony planer.
1—24 x 6 **Indiana** smoothing planer.
1—24 x 7 **Frank** & Co. single surfacer.
1—26 x 8 **Cordes**man No. 22 single surfacer.
1—30 x 6 **Rogers** single surfacer.
1—30 x 6 **Buss No. 1 single cabinet planer.**
1—30 x 6 **J. A. Fay & Co. No. 4½ single cabinet planer.**
1—30 x 6 **Berlin No. 3 single cabinet planer.**
2—30 x 6 **Dennis single cabinet planer.**
1—30 x 7 **Buss No. 3 single cabinet planer.**
2—36 x 7 **Whitney single cabinet planer.**
2—36 x 6 **Egan Co. No. 4 single cabinet planer.**
2—40 x 7 **Buss No. 3 single cabinet planer.**
1—50 x 7 **Buss No. 3 single cabinet planer.**
1—26 x 8 **W. R. & R. endless bed single surfacer.**
1—24 x 6 **J. A. Fay & Co. endless bed single surfacer.**

All machines furnished complete and in condition to give proper service.

Whatever you want—write us.

Can't we put your name on our mailing list for our monthly Wayne List?

FOR SALE

12 Invincible and Columbia sanders, 30-in., 36-in. and 42-in. sizes. All carefully rebuilt and in good working order.

Also planers and matchers, surface planers, molders, resaws, cut-off saws, gang edgers, and many other woodworking machines of best standard makes; all in good working condition and furnished at cost. Send for full information and prices.

H. B. Smith Machine Company. **Smithville, N. J.**

FOR SALE

Exhaust fan, dust-collecting outfit; also furniture polishing machine.

...cas & Son. **3 Fox St., Bridgeport, Conn.**

CUT PRICES

In Modern Woodworking Machines

Band saw, Fay 33-in., with 10 saws, $50.
Band saw stretcher, Covel 8-in., $45.
Band resaw, Cordesman No. 3½, 42-in., used 6 months, good as new, 6 blades, only $350.
Bed clamp, Benedict, $50.
Blower or exhaust fan, Champion No. 4, 25 in., $15.
Borer, Dennis horizontal with slide spindle, $50.
Box matcher with press, Chase, No. 227, pwr. fd., used 3 months, $175.
Combination saw, Burlington, $25.
Cut-off saw, Hamilton Auto Railway, No. 97, $75.
Cut-off saw, Beach, No. 3, box and furniture makers, double, good as new, $100.
Door clamp, Hall & Brown, 8 x 4, good as new, $75.
Dowel or rod mch., Hamilton 2-in. power feed, nearly new, $75.
Floorer, S. A. Woods No. 2½, 15 x 6 in., 4-side, $235.
Glue heater, Francis No. 10, $5.
Jointer, Buss 16-in., $50; Berlin 24-in., round safety head, $125.
Knife grinder, Fay & Egan 30-in., auto, $50.
Lathe, Hoyt wagon axle, automatic, $100.
Lathe, Ober Broomhandle, auto, $50.
Lathe, Klotz, nearly new, spoke and handle, $100.
Lathe, Merritt table leg and baluster auto, $125.
Lathe, Waymoth, with circular knife, 8 heads, $75.
Lathe, Whitney 30-in., auto back knife gauge, $100, rebuilt.
Lock corner box machine, used 6 months, $275.
Mortiser, New Britain chain saw with 6 chains, good as new, $200.
Moulder, modern Hamilton, No. 28, 9-in. 4-side, rebuilt, $175.
Moulder, Smith 8-in. 4-side, rebuilt, $100.
Planer, American Clement No. 4, 24 x 6-in. cabinet, heavy, $175.
Planer, American Clement No. 4, 24 x 7 in., dbl. heavy, $250.
Planer and matcher, Ball 24-in., heavy single, $75.
Planer and matcher, Fay 24 x 6 in., 6-roll, 4-side, $250.
Planer and matcher, G. & W. 26 x 6 4-side, $250.
Planer, Frank 20 x 6 pony dbl., $100.
Planer, Frank, 20 x 6, No. 101, double planer, modern, fine order, $150.
Panel raiser, Smith upright hand feed, $35.
Resaw, Goodell & Waters, 24-in. circular, rebuilt, $75.
Resaw, Smith, 36-in., 4-roll, $125.
Ripsaws, 10 wood frames, iron tops, hand-feed, $15 each.
Ripsaw, Williamsport, self feed, rebuilt, $75.
Sander, Cordesman-Meyer, 24-in., iron frame, hand feed, $50.
Sander, Fay & Egan, 48 in., dbl. disk, never used, $100.
Sander, Fay & Egan 42-in., No. 4, 3-drum, $350.
Sander, H. D., feed, with 2 drums on one shaft, $25.
Scroll saw, Fay, iron table, $25.
Shaper, Egan single spindle with reverse counter, $65.
Shaper, Fay dbl. spindle, $35.
Siding resaw, McNish & Butler, 24-in., $50.
Sticker or flag stick mch., F. & E., 4-in., 2-side, $75.
Tenoner, Fay double head and double cope, rebuilt, $100.
Woodworker, Fay 8-in. Universal, rebuilt, $110.
Woodworker, Fay & Egan No. 77 Variety, never used, with borer, $135.

This is only a partial list. We have just bought a furniture factory and planing mill. Machines not listed yet. Let us know what you want. We have it and at very low price.

Woodward Machinery Co. **514 Main St., Cincinnati, '**

NOBLE BARGAINS

Why Buy "Scrap" at Machinery Prices When You Can Get Machinery at "Scrap" Prices, Rebuilt the "Noble" Way and Backed by a Half Million Dollar Guarantee

A few of the hundreds of bargains in stock:

36 in. Bentel & Margedant band saw, rebuilt, $60.
20 x 6 Fay & Egan No. 2 pony planer, rebuilt, $90.
24 x 6 Hall & Brown No. 33 finishing planer, rebuilt, $100.
24 x 6 C. B. Rogers dbl. belted planer, 4r driven, rebuilt, $100.
27 x 10 S. A. Woods No. 55 double surfacer, rebuilt, $225.
24 x 6 "Happy Thought" 3-side planer & matcher, rebuilt, $200.
24 x 6 No. 2½ "Clipper" 4-side planer & matcher, rebuilt, $225.
18 x 6 Ross "Little Giant" 3-side planer & matcher, rebuilt, $100.
Fay No. 2 horiz. hollow chisel mortiser, rebuilt, $125.
Indiana double spindle shaper, new, $115.
6-in. 4-side Rowley & Hermance moulder, rebuilt, $100.
8-in. 4-side Indiana moulder, practically new, rebuilt, $125.
"Hoosier" self-feed rip saw, used 2 weeks, rebuilt, $110.
Fay & Egan jig saw, same as brand new, rebuilt, $20.
Egan 30-in. 2-drum sander, well worth $225; rebuilt, $150.
Milwaukee 42-in. 3-drum sander, worth $350; rebuilt $225.
Swing saw: Egan pipe frame, rebuilt, $20.
Famous single arm swing saw, 6 ft. cast frame, new, $28.
No. 27 combination rip and cut-off saw complete, new, $50.
38-in. B., T. & B. style E knife grinder and saw gummer, rebuilt, $40.
Fay & Egan No. 1 railway saw, nearly new, rebuilt, $50.
Fay single end tenoner, double heads and copes, rebuilt, $70.

The Noble Machine Co. **Ft. Wayne, Ind**

SOME SPECIAL BARGAINS IN HIGH GRADE WOODWORKING MACHINES

Cordesman-Rechtin Co. make 42-in. band resaw, $325.
Egan Co. make No. 9 50-in. band resaw, $225.
B., T. & B. knife grinder, 26 in., full automatic, $75.
F. & E. Co. No. 4 graduated stroke mortiser, good as new, $150
F. & E. Co. jointer, 24 in., $85.
Planer and matcher, 3-side, 24-in., good as new, $250.
Fay & Co. rod machn., 6 rolls, power feed, capacity up to 2 in., $65.
Wood worker and moulder combined, thoroughly refitted, $225
Double cut-off saw, power chain feed, fine order, $150.
Railway cut-off saw, automatic power feed, $90.
Inside moulder, Woods No. 115, 10-in., 4-side, $300.
Moulder, Egan standard type, 8-in., 4-side, $135.
Moulder, American, 8-in., 4-side, fine order, $250.
Moulder, Houston, 10-in., 4-side, extra heavy, $300.
Planer, Fay & Egan No. 4, divided roll and chip breaker, $17
Wood turning or breast lathe, 12 in., $32.50.
Spoke lathe, F. & E. Co. No. 22, perfect order, $225.
Sander, Egan 30-in., 2-drum, $150.
Sander, American, 42-in., 3-drum, $425.
Shaper, double, F. & E., No. 85, $100.
Tenoner, F. & E., roller table, single heads, $100.

The above are only a few of the refitted wood working lines we have to offer. Send for complete price list.

E. Rechtin & Bro., 215-219 Butler St., Cincinnati, Ohi

BARGAINS EXTRAORDINARY

WOODWORKING

1 10-in. 4-side molder, Colloday.
1 36-in. automatic knife grinder.
1 16-in. hand jointer, Goodell & Waters.
1 Alber stair router.
1 30 x 6 J. A. Fay & Co. double surfacer, divided feed rolls, cabinet type, A-1 condition, $300.
1 30 x 8 Money Maker double surfacer, weighing about 10,000 lbs., A-1 condition, $400.
1 15-in. 4-side inside matcher, J. A. Fay & Co. make, fine condition, $250.
1 7-in. 4-side Holmes Atlantic inside matcher in fine condition, $200.
1 15 x 6 J. A. Fay & Co. inside matcher in fine condition, $250.
1 15 x 6 J. A. Fay & Co. inside matcher in fine condition, $350.
1 24 x 6 planer and matcher, 4-side.
1 2-saw edger, 24-in., in fine condition, $50.
5-Cabinet single surfacer.
2 Tenoning machines.
2 Double cut-off saws.

SPECIAL BARGAINS IN SANDERS

1 42-in. 3-drum Perfection sander, thoroughly overhauled, $350.
1 48-in. 3-drum Thomas sander, $400.
1 48-in. 3-drum H. B. Smith sander, $500.
1 54-in. 3-drum J. A. Fay & Co., fine order, $500.
1 48-in. 3-drum Royal Invincible sander, $550.
1 60-in. 3-drum Columbia sander, in A-1 condition, $600.

JOINTERS

1 18-in. Crescent hand jointer.
1 16-in. Goodell & Waters hand jointer.
1 18-in. Crescent hand jointer, in A-1 condition, $90.
1 30-in. Buss extra heavy hand jointer, $125.

Woodworking machinery of all kinds.
Write, stating your requirements.

CLEVELAND BELTING & MACHINERY CO

1922 Scranton Road, Cleveland, Ohio

ESTABLISHED 1847

SMITH OF SMITHVILLE

INCORPORATED 1878

Woodworking Machinery

Front Side View of

No. 14-A Planer and Matcher

A **combined** machine that will surface 24″ x 6″ and match 14″ x 4″ and will plane **two** boards at a time.

Send for Circulars

H. B. SMITH MACHINE CO.

SMITHVILLE, N. J., U. S. A.

New York **Chicago** **Atlanta** **San Francisco**

CLARAGE FANS

are adjustable in every way. Any direction of discharge—pulley on either side—fan upside down or right side up —the standard fan is suitable.

Every fan is equipped with Clarage Bearings. They are better bearings.

Write for detailed information.

CLARAGE FOUNDRY & MFG. CO.
HEATING, VENTILATING AND DRYING ENGINEERS
KALAMAZOO, MICH.

EASTERN BRANCH — 149 BROADWAY, NEW YORK, N. Y.

The New Britain

CHAIN SAW MORTISER

This machine has the speed and working capacity of almost twice that of any other type of mortiser. It will make a mortise six inches deep in six seconds without any boring and it also does not leave any core to clean.

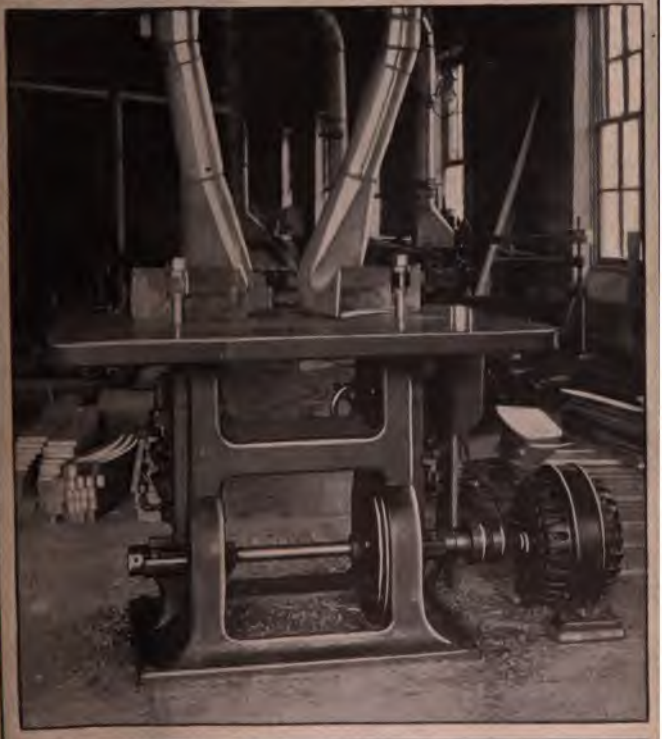
The New Britain Mortiser cuts all the time instead of intermittently

Ask us for detail information on this mortiser and we will tell you just how much time it will save you in your work.

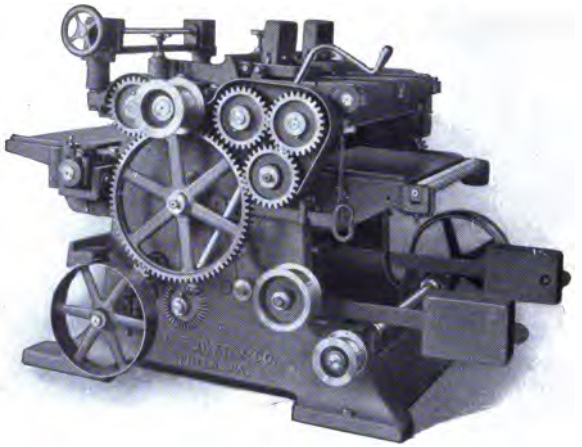
THE New Britain Machine Co.

16 Chestnut St. NEW BRITAIN, CONN.

WOODCRAFT



SEPTEMBER · 1914



ANTIQUATED METHODS ARE MORE COSTLY THAN NEW MACHINES

Power's No. 14 Surfacer

is our very latest production and it combines the facilities for both single and double surfacing.

It will plane 26 inches wide and 8 inches thick, and is exceedingly well built.

Send for our new folder describing it

Wm. H. Field Co.
Boston, Mass.

L. Power & Co.

Eby Machinery Co.
San Francisco, Cal.

Olney & Warrin
New York

6 South 23rd Street
Philadelphia, Pa.

Zimmerman-Wells-Brown Co.
Portland, Oregon

We make Band Saw Blades of Imported Steel They Last Longer

Handy Clamps are Better

No. F
Screw is 2 inches above Tempered Steel Bar

No. C
Tempered Steel Bar Clamp

Guaranteed not to buckle the work.

Tempered Indestructible Steel Bar Clamps. Screw works in two bearings, increasing the life of the clamp over 100 per cent.

"Handy" Patented Steel Spindles and Steel Nuts on "Hand Screws" guaranteed not to break.

No. A

Can be kept rigid or attached in any position.

Strongest Hand Screw Made

Works nearly ***twice as fast*** as common wood screws. Spindles have a right and left hand thread. Gives a tighter grip and less power required. Glue cannot stick to spindles. Handles guaranteed not to get loose. Jaws are best seasoned maple.

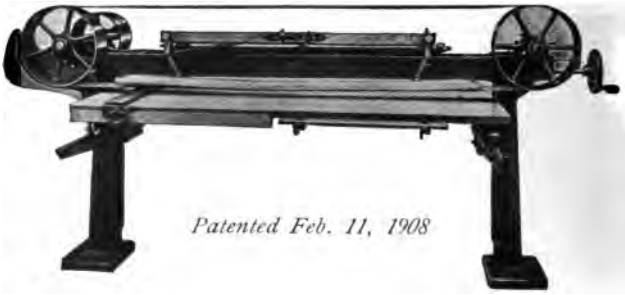
Try our "Mitre" Clamp also our "Frame" Clamp.

....ORDER SAMPLES....

Send for Catalogue and Prices of Full Line of Clamps

HANDY MFG. CO. 27 E. Madison St. CHICAGO

Our Twentieth Century
BELT SANDER



PERFECTION IN ITSELF

Will do double the amount of work of a hand block machine and do it better and easier.

Complete Control ***Only One Lever***

enables the operator to sand his work at any point, as much or as little as he pleases, without changing his position.

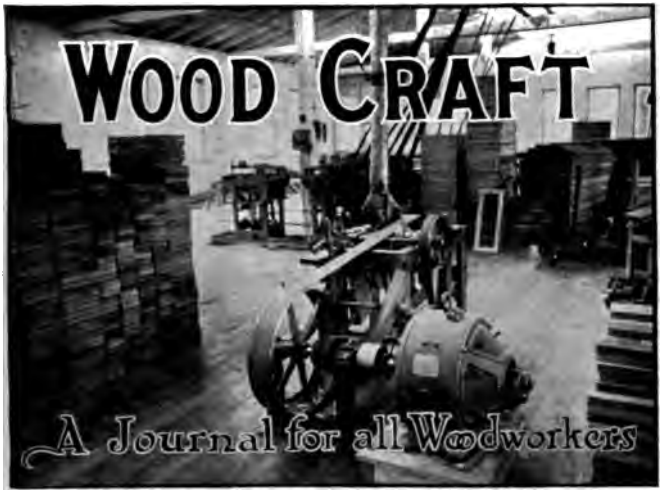
OUR SPECIALTY IS

RUBBING AND POLISHING MACHINES
BELT SANDERS
DOUBLE MITRE SAWS

Write for circulars to

Maddox Machine Company

Jamestown, N. Y.



Published by
THE GARDNER PRINTING COMPANY
CAXTON BUILDING · CLEVELAND, OHIO

VOL. XXI SEPTEMBER 1914 No. 6

WRINKLES FOR WOODWORKERS

Outlook is ever a matter of insight.

The lame excuse shows up a mental cripple.

He that stands in line with emerywheels or pulleys has a habit to unlearn.

Stop the machine for adjustment or for oiling, or the operator may himself stop.

Patience is due the helper; were he as fully informed as yourself, you wouldn't expect him to be a helper.

Machines are jealous of neglect, and divided attention *can spoil* the work or possibly do more *serious damage.*

SAW GUMMING ATTACHMENT

RADIALLY swinging arm is pivoted o secondary arm which is adjustable to f the teeth properly and carries saw to from emery-wheel. Attachment can placed on any ordinary emery-stand and is fully

Practical Saw Gumming Attachment

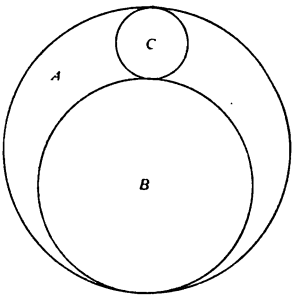
justable for giving the sawteeth any shape and suit the bevel on the emery-wheel. It fits Nos. 4 481, and 482 Mummert-Dixon oilstone grind and is manufactured by the Mummert-Dixon C Hanover, Pa.

Many a thieving machine in grabbing at velry on a hand has crippled the fingers. A lo ng glove has also tempted trouble.

A KINK IN THE CHANGING OF PULLEYS

A very useful wrinkle not any too generally known

AMONG the many wrinkles for mechanics worked out by Prof. John E. Sweet of Syracuse, N. Y., is the following: In changing pulleys on lineshafts or other places it may be desirable to know how much to cut out, or add to a belt, and have it come right. That is to say,



A Feature About Pulley Sizes That Is Often Very Useful

if a belt runs over two pulleys 30 inches in diameter, and the pulleys were to be changed to 36 inches, the belt would need to be as much longer as one set of pulleys is larger around than the other.

The ordinary way to determine that distance would be to figure the distance around each pair and then subtract the one from the other; but that is not at all necessary, for the difference of the distance around two pulleys of unequal size is the same as the distance around a small pulley the diameter of which equals the difference between the diameters of the two.

For instance, the distance around a 14-inch pulle·

is 44 inches, and the distance around a 21-inch pulley is 66 inches; but, knowing the fact that the difference is the same as the distance around a 7-inch pulley, it is only necessary to determine that to get the correct result, 22 inches.

Professor Sweet concludes his comments in the "American Machinist" by adding: The mathematicians will have to solve this algebraically probably, and some of the mechanics measure a few pulleys before they will believe it, while, I hope, there are others who will take my word for it and go ahead. I do not know but that this fact is as old as Egypt, and yet it may be new to many mathematicians that the circumference A in the illustration equals the sum of the circumference of the two, B and C.

SUCCESS OF LARGE WOOD RIM WHEEL

Big flywheel of wood safely turns at surprising speed

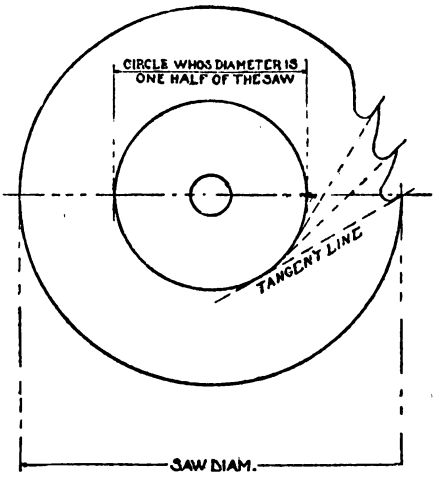
CONSTRUCTION of a big flywheel of wood in European plant is mentioned by "Power." Wheel is over 35 feet diameter; rim width of 10 feet, thickness 12 inches, and it is made of 44 thicknesses of beech with staggered joints, first glued and then bolted. Inside is double wheel. 24 cast-iron spokes being fastened to two cast-iron hubs. Wheel turns 76 times per minute, a rim speed of 139 feet per second or 94 miles to the hour, a remarkable record.

According to the official records the annual amount of wood used in the United States for the manufacture of caskets and coffins, 153,394,557 feet, is a little ahead of that required for the making of refrigerators and kitchen cabinets, 137,616,366 feet, board measure.

HOOK OF TEETH ON CIRCULAR SAWS

Explains a graphic way of getting very easily at the correct angle of sawteeth in the cutting of softwood

JUST about how much hook there should be to a circular-saw tooth has been defined in the handbook of the Simonds Mfg. Co., Fitchburg, Mass., after the following fashion: "We find in our experience that the hook



Simple Method of Finding Out Hook Faces of Sawteeth Correctly

of a saw to be normal must be tangent to a circle whose diameter is one-half that of the saw."

Some question having arisen as to the correct interpretation of the above sentence, a sketch has been made to show the matter more clearly.

Assuming that the saw is 60 inches diameter with about 90 teeth. Then a circle which is half the size of the saw diameter would therefore be 30 inches in diameter, and a line drawn tangent to the circle—that is, touching the edge of the circle but not cutting through it—determines by its slant the amount of hook required for the sawtooth at that point.

It is further mentioned that this angle of tooth front is especially for sawing soft wood. As the tooth wears down and gets smaller by use, the amount of hook will increase somewhat because there is then a smaller saw yet having the same number of teeth as were in the saw originally when new.

The diagram explains the method and the results obtained by it.

"Mechanical Properties of Wood," by Samuel J. Record, has numerous tables of strength values of important American woods, structural peculiarities are critically discussed, and methods of testing detailed. Containing 176 6 by 9-inch pages; price $1.75, net, from John Wiley & Sons, Inc., Fourth avenue, New York, N. Y., or our Book Department.

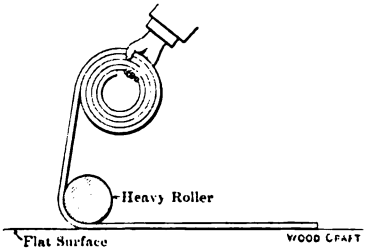
Annual report of the National Council for Industrial Safety, W. H. Cameron secretary, Continental and Commercial Bank building, Chicago, Ill., shows that the total number of workmen represented by its memberships is about 750,000. Organized only eleven months ago it has made rapid progress. Third annual Safety Congress will be held Oct. 13 to 15, 1914, at Chicago.

KINK FOR CLEANING BELTS

N. G. Near

NO doubt most readers know that a good way to clean leather and cotton belts that have become filled with grease is to submerge the belt in gasoline or naphtha over night and then squeeze out the grease.

Where no better method of squeezing out the dirt is available, a good scheme is to lay the belt on a



The Cleaning of a Belt

clean flat surface as shown in the engraving and lay as heavy a roller on one end as can be found. Then pull the belt up and roll it as indicated, at the same time causing the roller to roll along the belt and do the squeezing act. The flatter the surface and the heavier the roller, the better.

It might be well to caution the reader NOT to clean rubber belts in this way.

Power required for belts and line shafts is so big *an item that* the motor drive scores heavily in *saving of energy* consumed.

"Factory Organization and Administration," by Hugo Diemer, is now in a revised second edition dealing practically with management, finance, organization and control, accounting, reports, factory location and planning, employing labor, shipping, timetaking, costs, inventory, inspection, rate and time studies, wage systems, etc. Has 378 6 by 9-inch pages, numerous tables and forms, price $3. McGraw-Hill Book Co., Inc., 239 West 39th street, New York, N. Y., or our Book Dept.

State College of Forestry at Syracuse, N. Y., reports that only 40 per cent of the trees cut in forests of this country are used for lumber. Remaining 60 per cent represents pure waste as high stumps and tops either left to rot in woods or as slabs consumed in burner or slash piles at mill. Same authority further says that in Germany about 95 per cent of every tree grown in forests is used. Practically nothing from forest goes to waste; stumps are grubbed out and twigs and branches tied up into fagots for fuel.

"Lumber and Its Uses" is a book of 352 6 by 8¾-inch pages crowded with useful data on the structure of wood, physical properties, lumber grades, standard sizes, shipping weights, structural timbers, seasoning, wood preservation, paints and stains, wood paving blocks, hardwood flooring, fire resistance, lumber prices, uses of lumber, commercial woods, forest products, wood advantages, sources of formation. It's an excellent work by R. S. Kel-g. Freely illustrated. Price $1, from Radford hitectural Co., Chicago, Ill., or our Book Dept.

PERIOD STYLES SHOWN BY CHAIR LEGS

A few convenient pointers on identifying furniture

SKETCHES of the various styles of chair legs were contributed by A. Kirkpatrick to the "International Woodworker," from which the following abstract is made:

Chippendale.—Fig. 1 was named after its designer, the most famous chairmaker. He was born

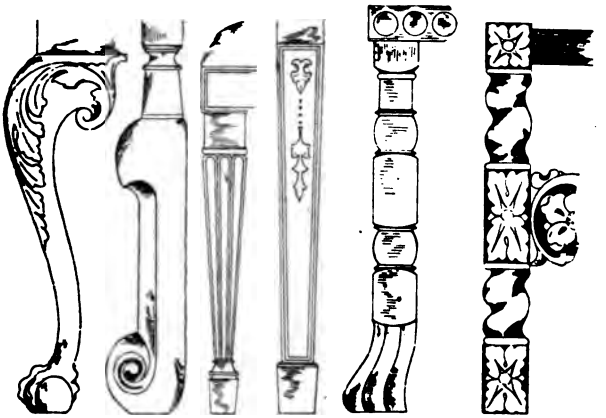


Fig. 1 Fig. 2 Fig. 3 Fig. 4 Fig. 5 Fig. 6

Handy Scheme of Identifying the Various Periods of Furniture

about 1710 and published his noted book, "The Gentlemen and Cabinet Makers' Directory," in 1784. His place of business was in St. Martin's lane, London, and he and his sons were designers, carvers and cabinetmakers.

Flemish.—Fig. 2 made its appearance in America *early in the* seventeenth century. Holland design-

ers about that period were especially good, and turned many fine effects. Some are still copied closely. Figs. 2 and 9 are among the most used. Fig. 2 is generally called the Flemish leg, while Fig. 9 is called the Dutch. These were generally accompanied with cane or rush seats, and often quite elaborately carved.

Sheraton.—Fig. 3 was named after Sheraton, an active designer about 1791. He was very broad in treatment of chairs, and there is a variety of his work to be found, but the tendency in his chair legs was to taper and flute.

Heppelwhite.—Fig. 4. Heppelwhite's favorite style of foot is now called "spade" shape, and used on tables, sideboards and chairs. He was active in London about 1789, and ranks next to Chippendale as a chair designer. The shield, the oval and the heart shape were outlines of a great majority of his work, but on account of lightness of stock were more delicate in construction than Chippendale designs.

Spanish.—Fig. 5 belongs late in the seventeenth century, coming from Spain and Portugal, covered with the splendid leather of Cordova and fastened to frame with large brass nails. The "Spanish" foot is seen on all makes of furniture, and with some variations of form, but always turned out at the base, like Flemish, and is fluted.

Italian.—The leg of the Italian chair of about 1680, Fig. 6, was generally carved and of a single rope twist. It was made of oak and strong in construction.

Louis XV.—Chief furniture characteristic of the period of Louis XV, Fig. 7, is the carving, dainty in shape, graceful in lines, and perhaps marks the

highest point art has attained. Louis XV furniture is the most graceful style of furniture.

French.—A modern French leg, Fig. 8, is sometimes called the serpentine leg, and is commonly used in modern tables, sideboards and chairs.

Dutch.—Fig. 9 is the Dutch foot of seventeenth century, and has very graceful lines. When corners

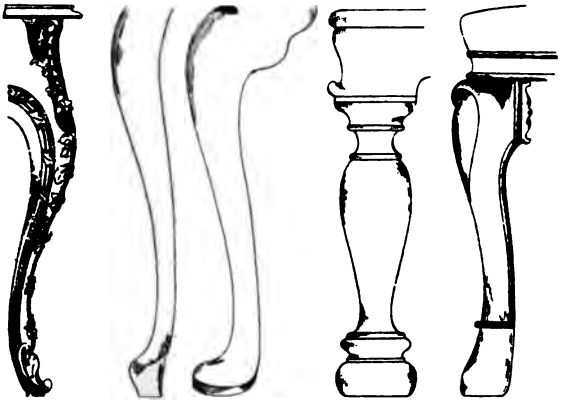


Fig. 7 Fig. 8 Fig. 9 Fig. 10 Fig. 11

Handy Scheme of Identifying the Various Periods of Furniture

are well rounded, it presents a beautiful effect on tables and chairs.

Turned.—Fig. 10 is the turned foot of about above period.

English.—Fig. 11 is of about last period of the seventeenth century, and shows English treatment of *Spanish style* at least as to foot. Curved back *and bandy leg* are quite Dutch.

DEFINITION OF A GOOD JOB

RICHARD C. CABOT, in the "Atlantic Monthly," undertakes to tell what is a good job. This is his idea of it: Difficulty and crudeness enough to call out our latent powers of mastery. Variety and initiative, balanced by monotony and supervision. A boss. A chance to achieve, to build something, and to recognize what we have done. A title and a place which is ours. Connection with some institution, some firm or some cause which we can loyally serve. Honorable and pleasant relations with our comrades in work. All this when boiled down looks as if Mr. Cabot sees a good job in a chance to do all we can for the employer who deserves all we can do.

Sawdust is shipped for use as ice packing, stable bedding, stuffing for upholstery, packing glassware, shipment of metals, crockery, etc. It is even used for manufacture of gunpowder, and in Europe it is compressed into briquettes and sold for fuel. A few plants already organized for utilizing sawdust for briquettes. Slabs, edgings and tops are converted into cooperage stock, broom and other handles, wood turnery, wooden dishes and novelties, dowels, furniture rounds, etc.

At the Forest Products Exposition were several cases showing uses made of mill waste. A knife manufacturer showed what could be done in making handles from the dogwood waste from shaping shuttle blocks. Another was the making of scrubbing brush backs from waste in manufacturing school furniture. Shoe lasts are made from discarded tenpins, veneer cores go into mine rollers and paper ulp stock, sawdust into floor sweeping compounds, d dowels are turned out of cooperage waste.

BUILDING UP A LIVE SHOP ORGANIZATION

Relation of the officers and team, authority and its exercise, methods of handling forces, training the men, and principles involved in assigning positions

JOHN CALDER, in a lecture at the Stevens Institute of Technology, examined the essential factors of a shop organization. To him organization is an economic necessity in the effective control of co-operative human effort. Some of his conclusions are appended in brief:

Organization deals with men rather than with things. Industrial organization includes elements of production, transportation and commerce. The business problem is to limit expenditure so a satisfactory margin of profit may be preserved. This requires effective team work of the officers and of the rank and file of the industrial team.

Organization is uniting and directing working forces to produce the most satisfactory result. Officials should operate a plant economically, anticipate business fluctuations, measure productive value and desirability of extension, check mere increase of size, and make reasonable provision for a contracting expense of organization during periods of depression.

In a certain sense the individual must organize his efforts if he is to be successful. To succeed, he must have a clear plan; he must determine upon method, and he must work persistently at the method. Frequent changes in method will not lead to success.

What is true of individuals applies even more to *action and reaction* of individuals in authority ove

one another, and with substitution of organization for individual new difficulties arise. Individual suffers only from his own lack of ability, but where more than one person is concerned there are dangers of misunderstanding, clashing opinions, diversity of interest, insurbordination, and intrigue. Organization can reduce these in direct proportion to its degree of efficiency.

Centralizing authority requires careful consideration. There are two extremes between which most desirable results lie. If officials are unrestricted in their actions the interest of the industrial organization is often lost to sight, and harmony in action becomes impossible. If all power of initiative is in hands of a central executive, he has an amount of detail causing great delay, and cannot study varying conditions, with a result that general rules are applied in cases requiring special attention. Under such management any emergencies are handled in a feeble fashion.

There are two methods of handling organization —division and department. Under divisional method, single enterprises have complete organization under one chief executive officer. Departmental method provides an officer in charge of all similar departments regardless where situated, with subordinate officers who report to him from each place.

In actual practice, divisional plan of organization is not completely carried out, as motives of economy and varying local conditions do not permit of sharp separation of work at different places.

With department organization this difficulty disappears, but others take its place. As a rule, no one epartment is sufficient unto itself, as it requires öperation of others. Under this method it is more

difficult to eliminate lack of harmony, because reference is made to a superior officer not closely in touch with local conditions.

Divisional organization tends to develop more broadly trained men for higher positions. Such men have "gone through the mill," and brought closely in touch with work other than that in which they have been employed, result being that they have a broader outlook upon industrial conditions.

Prime object of organization is to bring brainy men together for work and action. A wise organization seeks men of ambition. Success demands men of strong individuality, free to contribute their wisdom but making individual preferences secondary to general policy of organization. That work may be well done, and have its action strong and forcible, the organization must move as a harmonious unit. Mere scheming never leads to ultimate success. Herein lies task of leader—the organization of men, and systematizing of things. Both factors are important. It is fortunate when one individual combines capability in both directions.

Principles followed in a good organization may be outlined as: An executive with power to decide on all points where action must be taken is provided. Responsibility of each position is fully and carefully outlined, that misunderstanding may be avoided. Duties of positions conform satisfactorily to the ability of those chosen to fill them. No person is subordinate to two or more superior officers, if possible to avoid. Power to discipline men in any department rests in hands of official held responsible for results. Duties of members of organization are distributed so that a fair comparison of results is *possible.* *Wherever* possible, no positions on staff

are created which offer no further opportunity of promotion for an ambitious man.

THE MANUFACTURE OF MATCHES

White pine and its treatment, selection of stock, cutting up the material, coating of sticks, and the drying

E have been asked for a brief explanation of the manufacture of wooden matches. This is a specialty business of extreme type and the following is but a synopsis of the methods generally practiced so far as our information goes.

Match manufacturers buy their supply of white pine in the form of 2-inch lumber. This stock is dried either in a kiln or treated by air seasoning and then cut up into blocks 4 by 2 by 8 inches.

It is necessary in the manufacture of matches that the material be entirely free from all defects. When the blocks are sawn from the plank they are carefully watched and all knots and other blemishes and defects, such as pitch pockets, etc., must be completely cut out of the wood.

The blocks are then fed into a machine which cuts them into match sticks and in the same operation inserts the sticks into iron plates or containers.

These iron plates with the match sticks inserted in them then pass by way of a conveyer system first through paraffin troughs, then through a sulphur trough, and finally through the reservoir holding the tipping material.

Lastly the iron plates are placed in racks for the match heads to dry, and in due course they are packed for shipment.

SOME INTERESTING HARDWOODS AND THEIR USES

BOXWOOD tree is of light and dark yellow tints, very hard, dense, uniform in structure, allowing a fine finish. European boxwood is used for musical instruments and fine woodworking; the finest wood comes from Asia Minor and Persia. For decades the coast districts in these countries have been exploited, and it is necessary to go deeper into the interior for supplies. African, West Indian and Australian boxwood are suitable substitutes.

In same category belongs the West Indian grenadilla or cocoanut wood, which has a copper-red color, showing a violet streak, with an odor of rose, used for fine musical instruments.

From the Portuguese island of St. Thomas comes Cabole wood, having a yellowish or light brown color with darker streaks, is hard and durable like mahogany, is easily worked and gives a fine finish. Its specific gravity, 0.78, nearly that of mahogany. It is used for making curios and is very expensive. Heavier than above is West African olive wood. It is hard to work, having extreme hardness, heavier than water in specific gravity, and is about as heavy as ebony. Close-grained structure, yellowish-red tone, fine polished finish, and resistance to temperature changes make it a very desirable wood.

Mangrove forests of Africa might be mentioned, from which large quantities of timber are exported. The wood allows wonderful color effects to be produced, has a pleasant scent and is said to permit *the woodworker* to obtain most gorgeous or harmonious *color effects* imaginable.

MATERIALS AND MANUFACTURE OF TOOTHPICKS

Responding to query we give summary of the toothpick business as far as factory features are concerned

E have received an inquiry regarding the manufacture of toothpicks. S. L. Wolfe, statistician of the Forest Service, forwards following information of various processes in manufacture of toothpicks from selection of the stock to the packing. Steps in factory progress are:

1. Sawing logs into bolts 4 feet long. 2. Cutting out the knots. 3. Boring center holes. 4. Barking. 5. Steaming. 6. Cutting bolts into veneer by rotary process (center cores 3 to 4 inches in diameter). 7. Cutting veneer into strips corresponding in width to the length of a toothpick. 8. Cutting veneer strips into the picks in stamping machines. 9. Drying and seasoning. 10. Rounding ends in finishing machines. 11. Polishing by friction process in revolving cylinders. 12. Packing (packages contain 1,000 picks and sell for 8 cents per package, approximately $9 per carload).

Labor required to operate a toothpick factory is the usual skilled workman employed in veneer-making concerns. Finishing machinery for rounding ends of picks is usually operated by girls. One girl can tend two machines with ease. Packing is done by girls, and requires deftness and skill due to fact that toothpicks come from polishing cylinders in a very tangled condition, and must be arranged to point all one way for packing.

Use of toothpicks was introduced into the United tates from South America. Chas. Forster in 1853, iveling in Rio Janeiro, observed the natives using

pieces of orange wood for picking their teeth. He brought 75 cases of the sticks to Boston, but had great difficulty in selling them.

With characteristic New England ingenuity he set about creating a demand for toothpicks and began their manufacture by hand. His method of creating a demand was very simple.

Among his acquaintances was a man of striking appearance but equipped with no means of earning a livelihood. He sent this fellow dressed in the height of fashion to the restaurants and hotels in and around Boston to dine. After he had finished his meal he would demand a toothpick and on being refused would make a remark on the remissness of that particular establishment. Mr. Forster, appearing soon afterwards, would usually receive an order.

It took twenty years of constant study by an ingenious mechanic employed by Forster to invent machinery for the manufacture of toothpicks. Success attended the venture, and the factory established in 1874 by Mr. Forster at Dixfield, Maine, is still in operation, and turning out toothpicks by the carload.

Maine is the center of production, due to the availability of suitable material (paper birch) and trained labor.

Material used in toothpick manufacture must be, first, quality, straight-grained wood, almost entirely free from knots, odorless, tasteless, white or nearly white in color and not splintery. Species best adapted and largely used is paper birch (Betula papyrifera). The other species used to a less extent are several varieties of hickory (hicoria ovata, hicoria minima, hicoria glabra); hard maple (Acer *saccharum), and* cottonwood (Populus deltoid

LONG AND SHORT SCREWDRIVERS

An old problem that has been many a time the cause of shop debate is here briefly but completely discussed by one who decided to solve it for himself

UST why a long screwdriver is so much easier to handle than a short one is not at first glance obvious. Control increases with the length, and there is a general belief that the hands are better applied in some way to the long screwdriver. Maybe there is more to it than that.

A correspondent of "Work" did not stop there. He made a diagram to clear up the matter satisfactorily to his own mind. Here it is. His conclusions are appended:

I have recently tried a few experiments with various screwdrivers to prove the contentions formed through constant practice. Pressure is the important factor in driving a screw, and if the turning leverage is increased, as with a broad or tee-shaped handle, or with brace and bit, the pressure should be increased proportionately. A screw can be driven in more tightly with a long screwdriver than with a brace and bit. The mechanical advantage gained with a brace is more in speed than power, and this is due to the insufficient pressure that can be given to counteract the slipping action caused by the tremendous leverage.

A long screwdriver is more powerful than a short one, not because of leverage gained in turning movement, as would be the case with a tee-shaped handle, but because of the minimized toppling in which the ool is less apt to slip out of the slot of the wood rew.

SEND AT ONCE FOR THIS

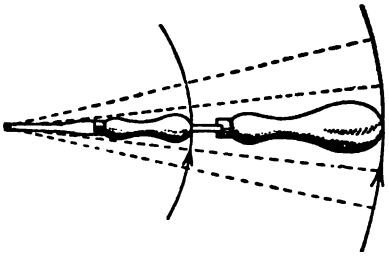
Free Book

CONTAINS A LARGE AMOUNT OF VALUABLE INFORMATION REGARDING

DISSTON
Inserted Tooth Saws

HENRY DISSTON & SONS, INC.
PHILADELPHIA, PA., U. S. A.

This is clearly demonstrated in diagram. Take the long screwdriver. It will be readily seen that if this topples over ½ inch out of vertical position, it will be the same as if the short screwdriver, which is half the length, moved ¼ inch; so if screwdriver is lengthened, toppling is prevented in same ratio. When using ordinary screwdriver there is always a tendency for it to topple in taking fresh grip at each half turn.



Applying Power to the Long and the Short Screwdriver

Another advantage of long screwdrivers—the length decidedly counteracts the toppling, as the downward thrust is more at right angles with direction of curve; but with the short screwdriver a slight departure from downward thrust is more likely to coincide with direction of toppling curve. This is reason a small screwdriver is so apt to slip in use.

Best screwdrivers invented are the Yankee reversible type. Handle does not turn, therefore thrust is direct and constant. Direct pressure is important for both driving and taking out screws. This tool does not slip, and the turning force is in same ratio as pressure applied.

Judge not lest ye be caught at it.

A Whitney is the Answer

To Every Planing Problem

No matter what kind of lumber you plane, seven widths of Single Surfacers and seven widths of Double Surfacers enable you to select the particular sized Whitney Planer best suited to your requirements.

And it can be either Belt Driven or Direct Motor Driven, without belts.

You obtain in a Whitney Planer all that superior skill, experience and highly-specialized ability can give toward the production of a planing machine that you can depend upon—as no other—to produce greatest volume and smoothest planing at lowest possible cost.

Tell us what kind of surfacing you do—we will make suggestions as to the means of equipping your Whitney Planer especially for your work with square cylinders carrying two or four knives or round cylinders and four thin high speed steel knives, sectional rolls and steel sectional chip breakers or flexible steel chip breakers, and jointing, grinding and setting devices.

——*WRITE*——

BAXTER D. WHITNEY & SON

WINCHENDON, MASS.

California Office, Berkeley, California
North Pacific Coast Office, Stetson-Ross Mach. Wks., Seattle, Wash.

Selling Representatives

Chicago Machinery Exchange, 1219-27 Washington Blvd., Chicago, Ill.
Wysong & Miles Co., Greensboro, N. C., Agents for Virginia
North and South Carolina, Georgia, Florida and Eastern Tennessee

OAK, TEAK AND SUBSTITUTES

OAK is a favorite lumber for woodworkers. America has about two hundred kinds of oak. The red and white oaks are chief in interest. Wasteful methods have forced Europe to look for its supply in other directions, and Japan is trying to export its oak into Germany. Japanese oak is rather knotted and gnarled, but gives a very pleasant color. Oak supply from Southern Russia seems to be more fortunate in this respect.

Best substitute for oak is the teak-tree, from India and Java, as also Burma and Siam. It is used extensively in shipbuilding, as wood is very oily and free of tannic acids, so that it can be used with iron construction, which latter does not rust in teak. Teak is little attacked by insects and does not warp. Teak-tree is tall, requires much air and is only at full growth when about 100 years old. Wood is specifically lighter than oak, but equal to it in strength and durability.

Annual exploitation of teak in Siam is 115,000 trees. Enormous demand has already made a dearth in this wood imminent, so that the elephants that haul the logs down to the coast have to penetrate deeper into the forests. Siamese and Burmese authorities have therefore enacted laws to protect the growths and prevent the wasteful policy that has ruined the supply elsewhere.

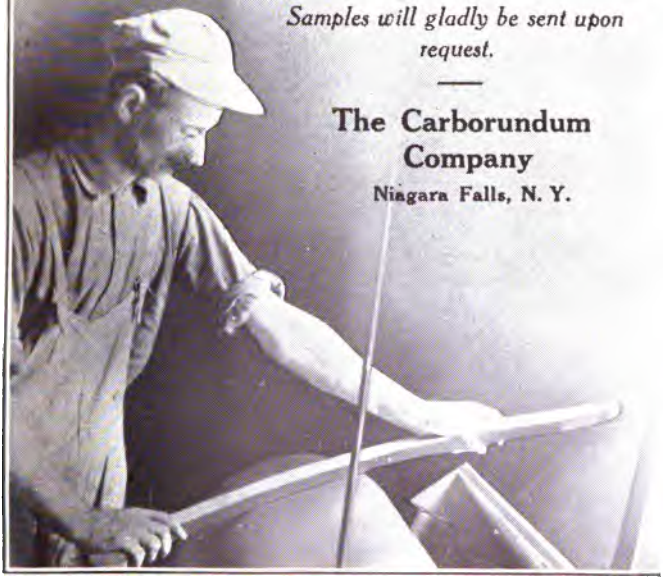
Increase in shipbuilding has made this wood scarce, and Australia has undertaken to provide a substitute in its eucalyptus-trees. These timbers are very hard and heavy, have a grayish and reddish hue, and are suitable for parquet floors and wood pavements.

This Man is Economizing

HE is getting clean, smooth, uniform results, he is saving time and paper. He is sanding chair parts, using

Carborundum Brand Garnet Paper

It cuts clean and fast—the paper is uniformly coated and the grains stay on, Carborundum Brand Garnet Paper cuts the cost of sanding.



Samples will gladly be sent upon request.

The Carborundum Company

Niagara Falls, N. Y.

Another substitute has been suggested in the so-called "Oukome," of which Hamburg imported about 70,000 tons in 1911. It comes from west coast of Africa, and is called either Gabun-cedar or African mahogany. The color varies from yellow to violet, the wood is not as hard as mahogany, and inferior to the latter in properties. It has been in the trade only twelve years, offers enormous supplies, and is reported excellent for veneered work.

EBONY AND CERTAIN IMITATIONS

BONY, probably the most costly of timbers, has been known for thousands of years. Supply in the main comes from Ceylon, Madagascar and West African districts. Wood is heavy, deep black, hard and solid with an eternally black color. It takes polish readily, and can be given the most beautiful finishes.

Ebony is imitated to a great extent by using the wood of fruit trees, especially of the pear-tree.

Lately Africa has furnished the Wat-wood, which seems to furnish a good ebony imitation.

An artificial ebony is also reported as made by taking a material of sawdust, water and blood, and compressing it under an enormous pressure.

There were used last year in New York State alone over 800,000 board feet of wood for dowels. Over 962,000 board feet of hardwoods were used for shuttles, spools and bobbins. Brushes and brooms consumed over 1,500,000 board feet, while toys used nearly 3,000,000 board feet of wood. These can be made from mill waste, short lengths, defective butts nd tops formerly considered of no value and left in oods.

On What Basis do You Buy Planer Knives?

If it is quality, you will be interested in knowing that the **"Coes" Planer Knives** rank A-1 in this respect.

Our meaning of quality is just this:—

The best material obtainable—uniformity of dimensions - uniformity of temper—special process—ground to a micrometer gauge—uniformity of finish.

Snug Fitting, Fast Cutting, Long Wearing

Every New "Coes" customer means a new "Coes" advocate —a new "Coes" advertiser.

A trial order will decide your source of Planer Knives Supply.

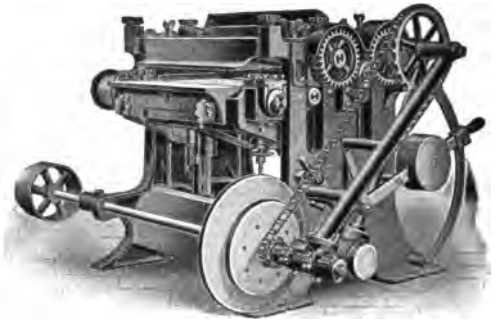
Remember the Name—
Remember the Mark

We are independent manufacturers, members of no association, no trust, and we make the best knives.

Loring Coes & Co.

Incorporated

Box C, Station B **WORCESTER, MASS.**



THE HOLMES NO. 46 VARIABLE FEED PLANER

will enable you to get business because it will handle any kind of stock for which you may have a call.

It feeds slow or fast as you desire. It will handle stock 24 inches wide and 8 inches thick, and give you good, smooth, fine appearing lumber.

This machine is a general utility planer which will not fail you.

Ask us for the names of those who have bought this planer. They will tell you that it is practically indispensable to them.

E. & B. HOLMES MACHINERY CO.

33 Chicago St. **BUFFALO, N. Y.**

WHAT IS THIS?

A Systematizer of the glueroom, some call it. Others say it is a **Common Sense Drier** for Crossbanding and Veneer.

IT IS BOTH!

If we give it away? No, not quite, but we sell it to reputable manufacturers on a blanket guarantee to turn out flat and bone dry crossbanding and veneer quicker and better than is possible in any other way.

Of course, you can get along without. You have done so, your father and your grandfather, perhaps, but maybe it would pay for itself in 15 to 18 months and do away with all your troubles, if you have any in your glueroom.

Tear this out and mail it to

"MERIT," - Lockport, N. Y.

Fare $3.00

—DAILY BETWEEN—

Cleveland and Buffalo

THE GREAT SHIP "SEEANDBEE"

Length 500 feet; breadth 98 feet, 6 inches; 510 staterooms and parlors accommodating 1500 passengers. Greater in cost—larger in all proportions—richer in all appointments—than any steamer on inland waters of the world. In service June 15th.

Magnificent Steamers "SEEANDBEE," "City of Erie" and "City of Buffalo"

Daily—CLEVELAND and BUFFALO—May 1st to Dec. 1st

Leave Cleveland -	8:00 P. M.	Leave Buffalo -	8:00 P. M.
Arrive Buffalo - -	6:30 A. M.	Arrive Cleveland	6:30 A. M.

(Central Standard Time)

Connections at Buffalo for Niagara Falls and all Eastern and Canadian Points. Railroad tickets reading between Cleveland and Buffalo are good for transportation on our steamers. Ask your ticket agent for tickets via C. & B. Line. Write us for handsome illustrated booklet free.

THE CLEVELAND & BUFFALO TRANSIT CO., Cleveland, O.

WARNING!

Poor imitations of our Guide are on the market. Avoid any possibility of claim suits by sending us your orders direct.

PATENTED
Aug. 12, 1890
Feb. 10, 1891
Mar. 28, 1891
April 12, 1891
April 25, 1893

New Patent Issued March 4, 1913

We are in a position to furnish you these guides at the same price you can buy the imitation, ***and further, furnish you a guide which we can guarantee.***

Send us your orders direct for ***Guide Repairs.*** Duplicate parts always carried in stock.

The Charles E. Wright Co.

Sole Manufacturers **Kenilworth, N. J.**

(Mention Wood Craft in writing)

Do You Make A Fair Profit?

THE AVERAGE LIFE of a manufacturing concern is fifteen years. Nearly 5000 went under last year. None of them knew their factory costs. 97% of all manufacturers do not know accurate costs. That's one of the big reasons why so many fail.

Do You Know Your Costs?

A DENHAM COST SYSTEM will give you absolute costs without expense or red tape. It is not a cut-and-dried system of forms but a service by expert investigating engineers who analyze factory conditions and build a system for each individual plant.

That's why Denham Cost Service has placed systems in 500 factories in over 80 cities. Denham customers say the system is indispensable in their business and pays dividends several times each year.

May we tell you how to make more profit in the furniture business?

¶ *"Science of Costfinding" sent free upon request.*

The Denham Costfinding Co.

Illuminating Bldg.

Cleveland

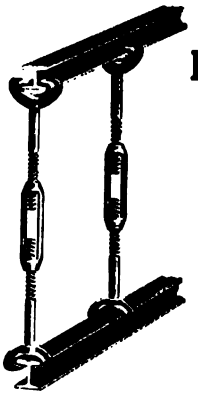
TO get the maximum capacity from your Continuous Feed Jointer, you should fit it with the Genuine Morris Wood & Sons 20th Century Solid Steel Guaranteed Glue Joint Cutters.

These cutters will be furnished on your new Jointer if you insist upon it. *Our Guarantee:* Better cutters have never been produced. Our thirty-eight years of cutter-making reputation back this guarantee. Can you beat it? Better get a line on our prices.

Write now for Circular W. C.
It tells all about them.

MORRIS WOOD & SONS

5108-5110 W. Lake St. CHICAGO, ILL.



SINGLE BEAM RETAINING CLAMPS

A mighty good thing for Hand Screw and other Veneer Presses, and practically invaluable for the Hydraulic Press. They are strong and durable, save fully half your time, and adjust quickly to different widths.

No. 1 for stock up to 18" wide
No. 2 for stock up to 24" wide
No. 3 for stock up to 31" wide
No. 4 for stock up to 36" wide
And larger sizes.

State daylight of your press and Clamp Rods will be made accordingly.

ORDER A SAMPLE LOT NOW

Everyone who tries buys a full equipment: There is a reason.

CHAS. E. FRANCIS CO. - Rushville, Indiana

Specialty Manufacturers Glue Room Equipment

SEND FOR SAMPLES

OF OUR

No. 7064 BROWN MAHOGANY
No. 7008 FUMED ACID STAIN
EARLY ENGLISH STAIN

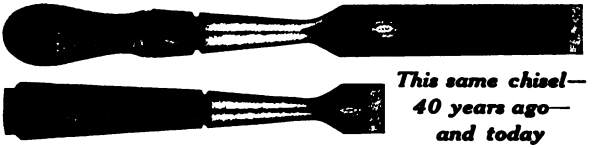
THESE are the three most popular finishes with the furniture and cabinet maker today.

Full directions for use sent with samples.

Also ask us for prices on Acetone—Amyl Acetate—Benzole—King Turpentine—Oil Soluble Colors—Water Soluble Colors—Spirit Soluble Colors—Creosote Oil—Acids, Commercially and Chemically Pure—Cyanide Potash—Bichromate Potash—Polishing Waxes—Cement Sticks—Orange Shellac.

WALTER K. SCHMIDT COMPANY

306-308 Monroe Ave. - - GRAND RAPIDS, MICH.



This same chisel—40 years ago—and today

It Took 40 Years to Wear Down This Chisel

and it is giving as satisfactory service today as when first bought.

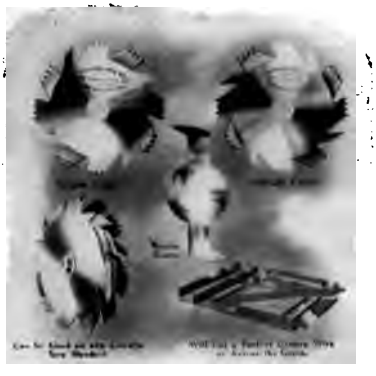
BARTON EDGE TOOLS

are made even better today than they were 40 years ago.

Specify them. If your hardware dealer should be unable to supply you, send to us for a catalog and our free Story Book entitled "True Stories." It is worth your reading.

MACK & COMPANY

Brown's Race near Platt St. ***ROCHESTER, N. Y.***



The Best Groover or Dado Heads in America are COCKER'S

Sizes ⅛" to 2" or more in width.

YOU will also find the Cocker Shingle, heading, concave, resaws and chisel-tooth saws to be the best on the market. We make knives of every description. They are fully guaranteed.

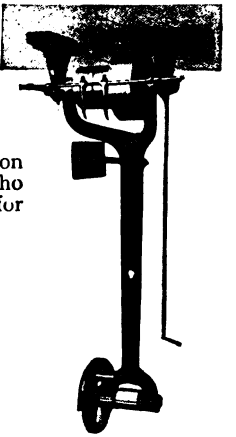
Write us for prices and complete description

THE COCKER MFG. COMPANY

85 Market Street : **Lockport, N**

Silver's Swing Saws

Band Saws, Saw Tables, and Jointers



The newest, most improved tools on the market. Made for those who desire positive high grade quality for every penny invested.

Jointers, 8, 12, 16, 20 and 24-in.
Band Saws, 20, 26, 32 and 36-in.
Swing Saws, 6½, 7, 7½ and 8-foot
Saw Tables, Two Styles

Send for catalog No. 60

The Silver Manufacturing Co. 345 Broadway Salem, Ohio

This is Something You Want!

IT will prevent you from making financial losses, also assist you in securing new customers.

THE RED BOOK

is published semi-annually in February and August.

It contains a carefully prepared list of the buyers of lumber in car lots, both among the dealers and manufacturers.

The book indicates their financial standing and manner of meeting obligations. Covers the UNITED STATES, ALBERTA, MANITOBA and SASKATCHEWAN.

The trade recognizes this book as the authority on the lines it covers.

A well organized Collection Department is also operated and the same is open to you.

Write for Terms.

Lumbermen's Credit Association

ESTABLISHED 1876

608 So. Dearborn St. CHICAGO — MENTION THIS PAPER — 116 Nassau St. NEW YORK CITY

No. 9

Automatic Self Feed

SLASHER or CUT-OFF SAW

Two hands free to handle the work means that twice an ordinary output can be secured with a Fischer Cut-off Saw.

This machine is so well constructed that it works perfectly under foot control.

Send for our booklet showing workmanship, design, etc. *Just mention WOOD CRAFT when you write.*

Fischer Machine Works

1841-45 Carroll Ave. CHICAGO, ILL.

"ANDREWS" Dried Lumber is Better Lumber

"ANDREWS" Products Represent Perfection—Reliability—Results

"Andrews" MOIST AIR Lumber Driers

Condensing
—— OR ——
Ventilated

Perfect Transfer Cars

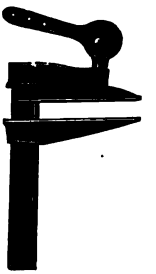
Perfect Dry Kiln Trucks

Canvas Dry Kiln Doors
DOUBLE AND SINGLE

Write for Information

DRIER DEPARTMENT
THE A. H. ANDREWS CO.
115-117 South Wabash Avenue - CHIC[A]

THE UNIVERSAL CLAMP



is a Time Saving, Quick Acting Clamp, especially adapted to Veneering, Paneling, and all kinds of work requiring long, broad jaw.

ASK FOR CATALOGUE No. 252

BATAVIA CLAMP CO.

165 Center Street, Batavia, N. Y., U. S. A.

Do you want any Technical Book on Woodworking Subjects?

We have a catalog which covers this line and will be glad to send you a copy

Free

Address

WOOD CRAFT

Cleveland, Ohio

CRESCENT
Woodworking Machines

Always satisfy our customers because they are right both in QUALITY and PRICE

Ask for complete catalog giving description of band saws, jointers, saw tables, planers, shapers, swing cut-off saws, planers and matchers, disk grinders, variety wood workers, universal wood workers, band saw blades.

The Crescent Machine Co.
220 Main St. . Leetonia, Ohio

TWO PATTERNMAKERS

Each using a feature of the

Original Five

Covered by the

Mummert-Dixon Oilstone Grinding System

Get Catalog No. 5

MUMMERT-DIXON CO., HANOVER, PA.

THE COAST LINE TO
MACKINAC
DETROIT, CLEVELAND, BUFFALO, NIAGARA FALLS.
TOLEDO, PT. HURON, ALPENA, ST. IGNACE.

"THE LAKES ARE CALLING YOU"

ARRANGE your vacation or business trip to include our palatial lake steamers. Every detail that counts for your convenience and comfort has been provided.

Daily service between Detroit and Cleveland, and Detroit and Buffalo. Day trips between Detroit and Cleveland during July and August. Four trips weekly from Toledo and Detroit to Mackinac Island and way ports. Special Steamer Cleveland to Mackinac Island two trips weekly June 25th to September 10th, making no stops enroute except at Detroit every trip. Daily service between Toledo and Put-in-Bay June 10th to September 10th.

Railroad tickets accepted for transportation on D. & C. Line steamers in either direction between Detroit and Buffalo or Detroit and Cleveland.

Send two-cent stamp for illustrated pamphlet giving detailed description of various trips. Address L. G. Lewis, General Passenger Agent, Detroit, Mich.

Detroit & Cleveland Navigation Company

Philip H. McMillan, *President.*
A. A. Schantz, *Vice Pres. and Genl. Mgr.*

The Expert Wood Finisher

A Complete Manual of the Art and Practice of Finishing Woods by Staining, Filling, Varnishing, Waxing, Etc.

By A. ASHMUN KELLY

339 Pages *6 x 9½ inches*

CONTENTS

Description of Woods Used in Wood Finishing.
Fillers for Filling Woods.
Finishing the Woods.
Filling and Fuming Oak.
Piano Finishing.
Finishing Veneer Work.
French Polishing.
Stains and Staining.
Various Stains for Various Woods.
Formulas for Staining Woods.
Shellac Varnish.
Flatting Varnish.
Examination and Testing of Varnish.
Varnish Troubles Explained.
Varnish and Varnishing.
Finishing Hardwood Floors.
Furniture Finishing.
Doing Up Old Furniture.
How to Treat Stains, White Spots, Etc., on Furniture.
General Information. A Glossary.

Price $3.00

Cabinet Making

By J. H. RUDD

If you are a worker in wood, whether in the factory or in the school-room, you will be interested.

A book written for the practical cabinet maker, in a practical way. Cabinet Making is not a treatise for beginners, but it will prove as adaptable to the student in the manual training class-room as to the factory worker. Its terse, free style is unburdened with technicalities and offers solutions of your own problems that you can apply in your own way.

Price $1.50

Wood-Turning

Uses of Wood-Working Machines and Pattern-Making

By GEO. H. RESIDES *and* HUGO DIEMER, M. E.

160 pages, 10 x 7, 169 illustrations

Wood-working and pattern-making are more fully treated in this book.

(1) The book is thorough.

(2) It gives a complete series of motion study pictures of wood-turning and wood-working, so that the reader can attain the best results with the minimum of risk and time.

(3) It describes the standard types of wood-working machinery and their uses.

(4) It furnishes a set of detailed working drawings of the sort that emanate from a well organized drafting-room.

Price $1.50

"Glue Handling" 1

A Manual for the Practical Glue Worker

By FRIMAN KAHRS

Pocket Edition of 180 pages. Blank pages for writing. Flexible binding, two pockets in cover for clippings, etc.

CONTENTS OF CHAPTER 1

1. Knowledge and System Applied to Glue Handling 19-29
   Preparatory Work up to 1898.
   Work Done Since 1898.
   Recent Editorial Comment.
   Ancient Methods and Modern Machinery.
   The Glue Testing Problem Now Solved.
   Glue Testing Figures Must Show Practical Working Capacity.
   What the Glue Specialists Should Know.
   Men Needed as Glue Specialists.

Price $1.00

Sent anywhere, postpaid, for the price

WOOD CRAFT BOOK DEPT. CLEVELAND, C

The MEETING PLACE of Employer & Employee

Advertisements under this heading FIVE CENTS PER WORD. Copy must be received not later than the 20th of the month preceding date of issue. If you do not find what you require, let us help you.

POSITION WANTED—In woodworking factory, by experienced superintendent or foreman of recognized ability and character. Practical mechanic, expert on factory organization, cost keeping, modern manufacturing methods. Address Box 305, care Wood Craft, Cleveland, O.

WANTED—FOREMAN WANTS POSITION. HAS BEEN foreman in shops for ten years; experienced in interior housework, bank, store and office fixtures, also furniture. References first class. Address Box 306, care Wood Craft, Cleveland, Ohio.

POSITION WANTED—ACCOUNTANT, 32 YEARS OF AGE, married, with years of experience in office work from bookkeeping to cost systems, is looking for position as either office manager or something similar. Good worker and good references. Address Box 307, care Wood Craft, Cleveland, Ohio.

POSITION WANTED AS SUPERINTENDENT, FOREMAN or mechanic in a planingmill or furniture factory. Until recently have had charge of a small planingmill and furniture factory, but owing to entire destruction of this plant by fire have been thrown out of a position, as the company does not intend to rebuild. Strictly temperate, steady, and can furnish good recommendation. Have had long experience and can prove to best of satisfaction. Address Box 308, care Wood Craft, Cleveland, Ohio.

LIST OF SAW MILLS

Also shingle and lath mills, creosoting plants, re-milling plants, crosstie, piling and stave producers in Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Tennessee, and Arkansas. Shows railroad location, daily capacity pine, also hardwood, capacity planers, steam and smoke kilns. $2.00 complete.

United Saw Mills Company, New Orleans, La.

MANUFACTURING IN CANADA

American manufacturers, contemplating the establishment of a factory in Canada, will save time by consulting us. We have complete detailed information on every commercial city, shipping facilities, power rates, raw materials, labor conditions, details of vacant factories, inducements, etc.

Dep't F, Heaton's Agency. Toronto, Ontario, Canada

TIMBER INVESTMENTS

We have a number of timber tracts offered for sale that are probably the most enticing investments offered in America today. Our list consists of all varieties of timber in different size tracts. We can please the most discriminating. Would be pleased to submit propositions on receipt of your requirements.

Great Northern Investment Co., Branch, Cloverdale, Ind.

WANTED

To get in touch with party having a good second-hand drykiln for sale. Also a bucket-ball machine and other machines for small articles, to use up the scraps from factory. Would like machines such as toy-making or clothespin machines. Address Box 309, care Wood Craft, Cleveland, Ohio.

A GOOD PROPOSITION

Complete woodworking plant just built and equipped, up-to-date in every respect; suitable for any furniture manufacturer or woodenware specialty or vehicle bodies. Sawmill adjacent for special cut stock. Low power rate, good railroad facilities. Will lease on cash or percentage basis with privilege of purchase. A good proposition to the man with cash for operating expenses. Address

Commercial Association. Crawfordsville, Indiana.

WILLIAM H. SNYDER

General Sales Agent

Rotary cut gum box shooks, etc.
Dimension oak and hickory lumber.
Three-ply panels, door stock, crossbanding, drawer bottoms, etc.

Submit your specifications for prices.

838 Jefferson Ave. Indianapolis, Ind.

GERLACH

Circular, Band and Cylinder Saws

New Roller Saw Swage and Sharpeners

Are unexcelled in Europe or America. We use the best steel, the finest equipment, and have sixty years behind us.

The Peter Gerlach Company. Cleveland, Sixth City.

WOOD CRAFT OFFERS THE EASY WAY OF GETTI[illegible] in touch with the buyers of machinery, firms that want and putting in touch men that want positions with the firm and at a very small cost. The "Wood Craft" c[illegible] columns are used by those who have and those who is the door of opportunity in the woodworking field

MACHINERY SECTION

Lists of Second-hand Machinery, for Sale or Wanted, will be published in this department at the rate of 35 CENTS A LINE each issue (nine words to the line). Name and address are not counted in the space charged for. Copy must be received not later than the 20th of the month preceding date of issue.

FOR SALE

Porch column lathe.

G. B. McCutcheon, **Big Rapids, Mich.**

FOR SALE

Veneer mill at West Point, Va., including toilers, engines, cutters, saws, driers, sander planers, electric plant, etc. Will give reasonable credit to proper party. Address

Mart Lane, **Wilmington, Del.**

FOR SALE

One vertical, semi-portable 18-h. p. engine and boiler, in good condition. Also one 24-inch 4-side planer, weight 5,000 lbs., manufactured by Glencove Machine Co. For particulars write

H. E. Rolland, Prop., Lawrence Planing Mill, Lawrence, Mich.

BAND SAWS CRACKING?

Overcome it and cut 10 per cent more and better lumber. A card gets convincing testimonials. Five minutes work. No change whatever in fitting. Run tension closer to edge and more of it. Price $2 with sample section of tooth. Your money back if not satisfactory.

Band saw templets; six hair line templets on a 14-in. templet, 14-gage piece; one edge straight, the other 45 in. Make your own gages from it, concave or convex, 25, 30, 40, 45 and 50-circle. Price $2.

These templets and instructions on overcoming band saw cracks, in one order, $3.

J. H. Miner. **Lumberton, Miss.**

DON'T YOU FORGET THAT IF YOU WANT TO SELL something, to buy something, to hire a man, to get a position, "Wood Craft" will do the business for you in the woodworking industry. A trial will convince.

CUT PRICES

In Modern Woodworking Machines

Arm sander, Hermance, hollow arm, splendid tool, never used, $50.
Band saw, Fay 33-in., with 10 saws, $50.
Band saw stretcher, Covel 8-in., $45.
Band resaw, Cordesman No. 3½, 42-in., used 6 months, good as new, 6 blades, only $350.
Bed clamp, Benedict, $50.
Blower or exhaust fan, Champion No. 4, 25 in., $15.
Borer, Dennis horizontal with slide spindle, $50.
Box matcher with press, Chase, No. 227, pwr. fd., used 3 months, $175.
Cut-off saw, Hamilton Auto Railway, No. 97, $75.
Cut-off saw, Beach, No. 3, box and furniture makers, double, good as new, $100.
Door clamp, Hall & Brown, 8 x 4, good as new, $75.
Dowel or rod mch., Hamilton 2-in. power feed, nearly new, $75.
Floorer, S. A. Woods No. 2½, 15 x 6 in., 4-side, $235.
Jointer, Buss 16-in., $50; Berlin 24-in., round safety head, $125.
Knife grinder, Fay & Egan 30-in., auto, $50.
Lathe, Hoyt wagon axle, automatic, $100.
Lathe, Ober Broomhandle, auto, $50.
Lathe, Klotz, nearly new, spoke and handle, $100.
Lathe, Merritt table leg and baluster auto, $125.
Lathe, Waymoth, with circular knife, 8 heads, $75.
Lathe, Whitney 30-in., auto back knife gauge, $100, rebuilt.
Lock corner box machine, used 6 months, $275.
Mortiser, New Britain chain saw with 6 chains, good as new, $200.
Moulder, Colloday 10-in., 4-side, fine modern tool, used but little, $250.
Moulder, modern Hamilton, No. 28, 9-in. 4-side, rebuilt, $175.
Moulder, Smith 8-in. 4-side, rebuilt, $100.
Planer, American Clement No. 4, 24 x 6-in. cabinet, heavy, $175.
Planer, American Clement No. 4, 24 x 7 in., dbl. heavy, $250.
Planer and matcher, Ball 24-in., heavy single. $75.
Planer and matcher, Fay 24 x 6 in., 6-roll, 4-side, $250.
Planer and matcher, G. & W. 26 x 6 4-side, $250.
Planer, Frank, 20 x 6, pony dbl., $50.
Planer, Frank, 20 x 6, No. 101, double planer, modern, fine order, $150.
Resaw, Goodell & Waters, 24-in. circular, rebuilt, $75.
Resaw, Smith, 36-in., 4-roll, $125.
Ripsaws, 10 wood frames, iron tops, hand-feed, $15 each.
Ripsaw, Williamsport, self feed, rebuilt, $75.
Sander, Cordesman-Meyer, 24-in., iron frame, hand feed, $50.
Sander, Fay & Egan, 48 in., dbl. disk, never used, $100.
Sander, Fay & Egan 42-in., No. 4, 3-drum, $350.
Sander, H. D., feed, with 2 drums on one shaft, $25.
Scroll saw, Fay, iron table, $25.
Shaper, Egan single spindle with reverse counter, $65.
Shaper, Fay dbl. spindle, $35.
Siding resaw, McNish & Butler, 24-in., $50.
Tenoner, Fay double head and double cope, rebuilt, $100.
Woodworker, Fay 8-in. Universal, rebuilt, $110.
Woodworker, Fay & Egan No. 77 Variety, never used, with borer, $135.

This is only a partial list. We have just bought a furniture factory and planing mill. Machines not listed yet us know what you want. We have it and at very lo

Woodward Machinery Co. **514 Main St., Cin**

FOR SALE

Used Woodworking Machinery

Band saws, West Side, 36-in., Fay & Egan, 42-in.
Borers, single spindle vertical, M. L. Andrews.
Borers, single spindle horizontal, F. H. Clement.
Borers, Fay & Co., 4-spindle, M. L. Andrew, 30 in., four spindles.
Carver, Buss, with bronze bearings.
Dovetailers, Dodds, 9-12-24 spindle.
Edger, Fay & Co., 10-foot, wood frame, hand feed.
Grinders, knife, B. T. & B. 44 in., cup wheel.
Jointer glue, Myers, chain feed, Buss, 6 ft. 6 in.
Jointers, Porter, 16 in., G. & K. 20 in., Cordesman 24 in., Buss 30 in.
Lathes, Trevor, for axle and irregular work.
Moulders, 6 in., 7 in., 8 in., 9 in., 10 in., outside.
Moulder, Fay & Egan, 8 in., inside.
Planers, single, pony, B. & M., 24 in.; Clement, 20 in.
Planers, single cabinet, American, 24 in.; Dennis, 30 to 36 in.; Buss, 30 in.; B. & M., 30 in.
Planers, double cabinet, Whitney, 26 in.
Sash sticker, Fay & Co., with P. & B. attachment.
Sander, Fay & Egan, 12 in., flat belt.
Sander, Mattison, No. 111.
Sander, Royal Invincible, 48 in., 3 drums.
Saw, Rowley-Hermance, combination saw and dado.
Saws, double cut-off, Fay & Egan, Buss.
Saws, cabinet, Carey, 2-arbor.
Saws, wood frame, all sizes, rip and cut-off.
Shapers, double spindle, Indiana, Buss, Clement.
Tenoner, double end, Fay & Egan, 90 in.
Tenoners, single end, Fay & Egan, wood frame.

The Chas. A. Strelinger Co.,

Woodworking Dept., 96-110 Bates St., Detroit, Mich.

SOME SPECIAL BARGAINS IN HIGH GRADE WOODWORKING MACHINES

Cordesman-Rechtin Co. make 42-in. band resaw, $325.
Egan Co. make No. 9 50-in. band resaw, $225.
B., T. & B. knife grinder, 26 in., full automatic, $75.
F. & E. Co. No. 4 graduated stroke mortiser, good as new, $150.
F. & E. Co. jointer, 24 in., $85.
Planer and matcher, 3-side, 24-in., good as new, $250.
Fay & Co. rod machn., 6 rolls, power feed, capacity up to 2 in., $65.
Wood worker and moulder combined, thoroughly refitted, $225.
Double cut-off saw, power chain feed, fine order, $150.
Railway cut-off saw, automatic power feed, $90.
Inside moulder, Woods No. 115, 10-in., 4-side, $300.
Moulder, Egan standard type, 8-in., 4-side, $135.
Moulder, American, 8-in., 4-side, fine order, $250.
Moulder, Houston, 10-in., 4-side, extra heavy, $300.
Planer, Fay & Egan No. 4, divided roll and chip breaker, $175.
Wood turning or breast lathe, 12 in., $32.50.
Spoke lathe, F. & E. Co. No. 22, perfect order, $225.
Sander, Egan 30-in., 2-drum, $150.
Sander, American, 42-in., 3-drum, $425.
Shaper, double, F. & E., No. 85, $100.
Tenoner, F. & E., roller table, single heads, $100.

The above are only a few of the refitted wood working machines we have to offer. Send for complete price list.

ouis E. Rechtin & Bro., 215-219 Butler St., Cincinnati, Ohio.

WOODWORKING MACHINERY BARGAINS

A few of the hundreds of machines in stock, which we are offering at Special Bargain Prices, for immediate acceptance and subject to prior sale. All machines REBUILT in a most thorough and workmanlike manner, TESTED in actual operation and GUARANTEED in strictly first-class condition for service.

The Noble Machine Co., Ft. Wayne, Ind.

Falls continuous feed glue jointer, less than 1 year old, $375.
Moulder, 9-in., 4-side, Fay & Egan No. 182, modern, worth $400, $250.
Moulder, 9-in., 4-side, Fay & Egan No. 14, "New Standard," $225.
Moulder, 10-in., 4-side, Rowley & Hermance, well worth $400, $225.
Moulder, 9-in., 4-side, Rowley & Hermance, new column (American), $225.
Moulder, 9-in., 4-side, J. A. Fay & Co., worth $300, $200.
Moulder, 8-in., 4-side, Indiana, extra good, worth $250, $135.
Moulder, 8-in., 3-side, J. A. Fay & Co., cheap at $200, $120.
Moulder, 6-in., 3-side, H. B. Smith, light pattern, $90.
Moulder, 4-in., 4-side, Hall & Brown No. 2, cheap at $135, $95.
Planer and matcher, 24 x 6, Indiana No. 2½, Clipper 4-side, 6-roll, $225.
Planer and matcher, 24 x 6, American "Happy Thought," 3-side, $200.
Planer and matcher, 6 x 2, C. B. Rogers No. 188, 4-side, 8-roll, $350.
Planer and matcher, 14 x 4, Preble, 4-side, 6-roll, big bargain, $450.
Planer and matcher, 18 x 5, Ross "Little Giant," 3-side, new, $100.
Double surfacer, 30 x 8, Fay & Egan No. 140, div. roll, $550.
Double surfacer, 27 x 10, S. A. Woods No. 55, div. roll, $225.
Double surfacer, 26 x 6, Buss 6-roll, sec. roll, modern, $500.
Double surfacer, 26 x 6, Graham No. 106, 6-roll, worth $450, $200.
Single surfacer, 44 x 7, Whitney cabinet, sec. roll, clamp boxes, $400.
Single surfacer, 36 x 7, Buss cabinet, solid roll, good, $300.
Single surfacer, 30 x 8, Berlin No. 152, divided roll, $275.
Single surfacer, 30 x 6, Fay & Egan No. 33, 4-sec. roll, $250.
Single surfacer, 24 x 6, Rogers, 4-roll, dbl. belted, $100.
Single surfacer, 24 x 6, Hall & Brown No. 33, nearly new, $100.
Single surfacer, 24 x 8, Josiah Ross No. 1 pony planer, $90.
Sander, 60-in., 2-drum Berlin sash with 10-in. disc, $250.
Sander, 42-in., 3-drum Berlin "Invincible" (3), from $450 to $275.
Sander, 42-in., 3-drum Milwaukee (Boardman), well worth $350, $225.
Sander, 36-in., 3-drum Berlin "Royal," well worth $500, $325.
Sander, 36-in., 2-drum J. A. Fay & Co., bargain at $275, $200.
Sander, 30-in., 2-drum Egan Co., fine shape, worth $225, $150.
Sander, 24-in., 2-drum Egan Co., extra good, worth $225, $135.
Sander, Black Bros., No. 1 Pioneer moulding cost $350, $150.
Sander, Maddox automatic sanding and rubbing machine, 6½ ft., $175.
Sander, Nash No. 5 broom handle, fine shape, cost $300, $165.
Tenoner, Fay single end, double heads and 2 copes, $85.
Tenoner, Colloday single end, double heads, cut-off, $85.

REMEMBER—Any woodworking machinery requirement can be promptly met.

WAYNE MACHINERY COMPANY

Taylor St. and Lake Erie R. R. **Fort Wayne, Ind.**

Successors by Purchase Hanna-Brackenridge Co.

Machines of relative merit at a lower cost.

Largest and most complete stock known from which to select the exact machine required.

Turning Machines

1 No. 8 Mattison baluster lathe.
1 No. 4 Mattison block and spindle lathe.
1 No. 0 Defiance Machine Works patent copying lathe.
1 22-in. Ober No. 2 automatic lathe.
1 36-in. Ober No. 2 automatic lathe.
1 No. 1 Ober ax handle lathe.
1 No. 3 Merritt gauge lathe.
1 No. 1 Trevor heavy gauge lathe.
2 Bowdle handle lathes.
1 3-in. Waymoth variety lathe.
1 24-in. Defiance patent variety lathe.
1 48-in. Defiance neckyoke and singletree lathe.
1 No. 35 J. A. Fay & Egan Co. back knife lathe.
1 No. 3 American Clement back knife lathe.
1 Peterlein back knife lathe 6 x 46 in.
9 12-in. to 24-in. wood turning lathes.
1 2-in. Tannewitz rod and dowel machine.
1 No. 2 Clement rod and dowel machine.
1 1½-in. Crescent rod and dowel machine.
2 2-in. Rogers rod and dowel machines.
Complete details furnished promptly on request.

All other types woodworking machines in about the same proportion.

Write for our "WAYNE LIST" of 700 machines in stock.

FOR SALE

Lathe mill and bolter combined, Frisby, nearly new, $100.
Mortiser, No. 3 Smith, $100.
Moulder, 6-in., 1-side, Smith, $70.
Moulder, 6-in., 2-side, Smith, $75.
Moulder, 7-in., 4-side, Powers, nearly new, $225.
Moulder, 9-in., 4-side, Houston, $300.
Moulder, 12-in., 4-side, American, $600.
Moulder, 12-in., 4-side, Woods inside, $250.
Planer and matcher, No. 44 Berlin, 9 x 6 in., $425.
Planer and matcher, Fay, 24 x 6 in., heavy, $400.
Resaw, band, American, 48-in. wheel, $600.
Resaw, circular, 42-in., $200.
Sawmill, band, 63-in. wheel, carriage 18 ft., $750.
Shaper, Indiana, 2-spindle, $110.
36-in. Buss double surfacer, thoroughly overhauled, $350.
Tenoner, Houston, double head and 2 copes, $175.
Tenoner, Hall & Brown, double head, 2 copes and cut-off saw, $140.

Badger-Packard Machinery Co.

W. Water St. **Milwaukee, Wis.**

BARGAINS EXTRAORDINARY

WOODWORKING

1 10-in. 4-side molder, Colloday.
1 36-in. automatic knife grinder.
1 16-in. hand jointer, Goodell & Waters.
1 Alber stair router.
1 30 x 6 J. A. Fay & Co. double surfacer, divided feed rolls, cabinet type, A-1 condition, $300.
1 30 x 8 Money Maker double surfacer, weighing about 10,000 lbs., A-1 condition, $400.
1 15-in. 4-side inside matcher, J. A. Fay & Co. make, fine condition, $250.
1 7-in. 4-side Holmes Atlantic inside matcher in fine condition, $200.
1 15 x 6 J. A. Fay & Co. inside matcher in fine condition, $250.
1 15 x 6 J. A. Fay & Co. inside matcher in fine condition, $350.
1 24 x 6 planer and matcher, 4-side.
1 2-saw edger, 24-in., in fine condition, $50.
5-Cabinet single surfacer.
2 Tenoning machines.
2 Double cut-off saws.

SPECIAL BARGAINS IN SANDERS

1 42-in. 3-drum Perfection sander, thoroughly overhauled, $350.
1 48-in. 3-drum Thomas sander, $400.
1 48-in. 3-drum H. B. Smith sander, $500.
1 54-in. 3-drum J. A. Fay & Co., fine order, $500.
1 48-in. 3-drum Royal Invincible sander, $550.
1 60-in. 3-drum Columbia sander, in A-1 condition, $600.

JOINTERS

1 18-in. Crescent hand jointer.
1 16-in. Goodell & Waters hand jointer.
1 18-in. Crescent hand jointer, in A-1 condition, $90.
1 30-in. Buss extra heavy hand jointer, $125.

Woodworking machinery of all kinds.
Write, stating your requirements.

CLEVELAND BELTING & MACHINERY

1922 Scranton Road, Cleveland, Ohio

Woodworking Machinery

A New Surface Planer

NO. 61-A SURFACER

Made with Square Head or Round Head, and with Whole Rolls or Sectional Rolls.

Send for Special Circular, Address

H. B. SMITH MACHINE CO.

SMITHVILLE, N. J., U. S. A.

New York Chicago Atlanta San Francisco

CLARAGE

BLOWERS-EXHAUSTERS
HEATERS-ENGINES

STEEL PLATE FANS

FOR HEATING AND DRYING INSTALLATIONS

OUR ENGINEERS WILL GLADLY ADVISE THE PROPER SIZE AND BEST ARRANGEMENT FOR YOUR WORK.

CLARAGE FOUNDRY & MFG. CO.
HEATING, VENTILATING AND DRYING ENGINEERS
KALAMAZOO, MICH.

EASTERN BRANCH — 149 BROADWAY, NEW YORK, N. Y.

GOOD WORK

FAST WORK

IF YOU JUDGE A MACHINE BY ITS OUTPUT—

THE NEW BRITAIN CHAIN SAW MORTISER

is worth twice that of any other machine on the market. Its continuous chain saw cut doubles its capacity and enables you to easily handle the most difficult work.

As a cost reducer it will pay you to immediately investigate this machine.

THE New Britain Machine Co.

16 Chestnut St. NEW BRITAIN, CONN.